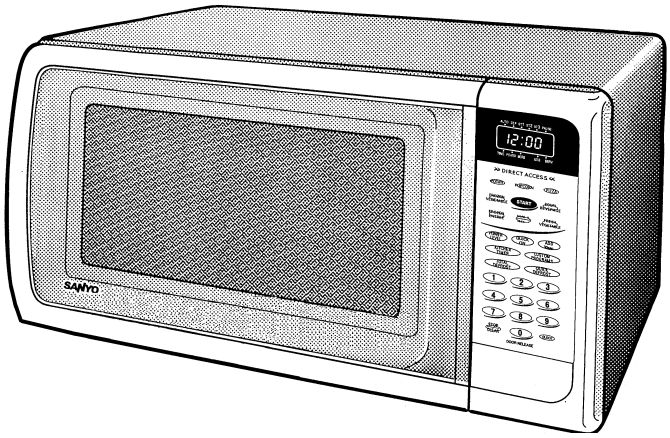
SANYO

File No :

SUPPLEMENT OF SERVICE MANUAL

Microwave Oven EM-P842WS (U.S.A.)



Product Code No.	437 480 04

See the Service Manual of EM-P672WS (SM-860245) except the items described in this Service Manual.

CAUTION
WARNING TO SERVICE TECHNICIANS

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(a) Do not operate or allow the oven to be operated with the door open.

(b) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary :
(1) Interlock operation, (2) proper door closing, (3) seal and sealing surfaces (arcing, wear, and other damage), (4) damage to or loosening of hinges and latches, (5) evidence of dropping or abuse.

(c) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.

(d) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.

(e) A microwave leakage check to verify compliance with the Federal performance standard should be performed on each oven prior to release to the owner.

REFERENCE NO. SS-860262

CAUTION

For microwave energy emission

On every service calls, check for microwave energy emission, must be made according to the following manner.

Measurement of energy emission

Measurement must be made with the microwave oven operating at its maximum output and containing a load of 275±15 milliliters of tap water initially at 20°±5° celsius (68 ±9°F) placed within the cavity at the center.

NOTE : The water container must be a 600 milliliter beaker and made of an electrically none conductive material such as glass or plastic.
The cook tray must be in place when measuring emission.

A properly operating door and seal assembly will normally register emission on greater than 4mW/cm^2 to allow for measurement uncertainty with the cooking shelf or tray in place.

All repairs must be performed in such a manner that microwave energy emission are minimal.

Follow the instructions supplied with a detector being used and performed an R.F. emission test around the door front and edges and all edges and vent of the outer case. The cabinet (wrapper) must be in place and the oven fully assembled.

When performing emission survey, with the meter on FAST RESPONSE the movement of a detector probe shall not exceed one (1) inch per second.

In the area emitting the highest reading, switch the meter to SLOW RESPONSE, and take a reading for minimum of three (3) seconds. We recommended the pattern outline shown below when the door surface is surveyed.

NOTE : Periodically check to be sure that the probe tip is not worn or dirty.

The following U.S. standard applies to microwave ovens :
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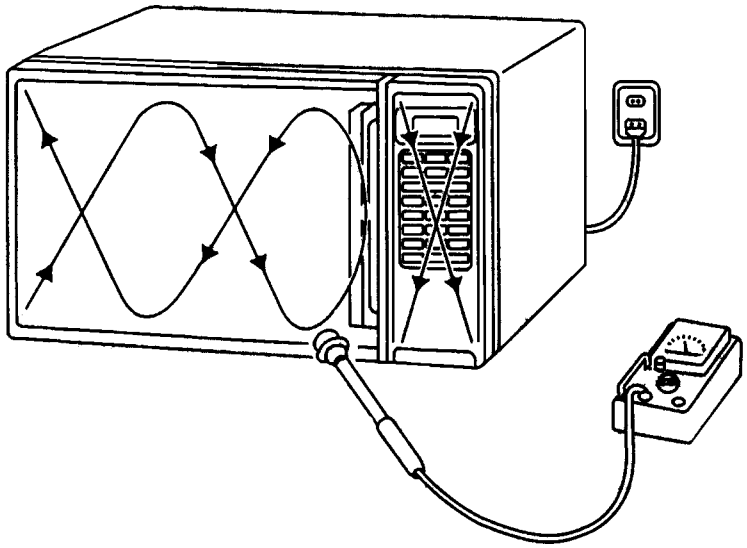
It requires that the power density of the microwave radiation emitted by a microwave oven shall not exceed five (5) milliwatts per square centimeter at any point 5 centimeter (about 2 inches) or more from the external surface of the oven.

All microwave ovens exceeding the emission level of 4mW/cm^2 must be reported to Dept. of Service for microwave ovens and the manufacturer immediately and the owner should be told not to use the microwave oven until it has been repaired completely.

If a microwave oven is found to operate with the door open, report to Dept. of Service, the manufacturer and CDRH* immediately. Also tell the owner not to use the oven.
*CDRH : Center for Device and Radiological Health.

The interlock monitor switch acts as the final safety switch protecting the customer from microwave radiation. If the interlock monitor switch operates to blow the fuse with interlocks failed, you must replace all interlock switches primary and secondary interlock switches and the monitor switch with new ones because the contacts of those interlock switches may be melted and welded together.



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1. SPECIFICATIONS

Rated Power Consumption ... 1650W.
Microwave Output ..... 1100W.
Frequency ..... 2,450MHz±50MHz.
Power Supply ..... 120V±12V, 60Hz.
Rated Current ..... 14.0 Amp.
Safety Devices ..... Thermal Fuse open at 332°F (167°C) for Cavity. Thermal Protector open at 275°F (135°C) for Magnetron. Fuse (Cartridge Type 20A), Primary Interlock Switch, Door Sensing Switch and Relay 2. Interlock Monitor Switch.
Timer ..... Electronic Digital, up to 99min. 99 sec.
Overall Dimensions ..... $23^{7}/_{16}$"(W) x $17^{5}/_{16}$"(D) x $14^{1}/_{4}$"(H).
Oven Cavity Size ..... $16^{3}/_{8}$"(W) x $15^{7}/_{8}$"(D) x $11^{1}/_{8}$"(H).
Turn Table Diameter ..... $12^{5}/_{8}$"
Effective Capacity of Oven Cavity ..... 1.9 Cubic Feet.
Net Weight ..... Approx. 44 Lbs.

2. POWER OUTPUT MEASUREMENT

NOTE

The Power Output specification 1100W on this model is measured with IEC measurement. The Power Output is measured with two (2) liters water is equivalent to 1100W in measurement with IEC, when measured with the following power output.

(A) 1. Fill two test bowls with each 1 liter water respectively.

2. Use accurate thermometer and measure each water temperature respectively.

(B) Place the two bowls on glass turntable.

(C) 1. Set cooking time to two (2) minutes. ("2 00" appears in display)

2. Touch "START" key and operate oven for exactly two (2) minutes.

(D) 1. Take out the two bowls at once.

2. Stir both water with thermometer and measure the water temperature rise respectively.

(E) 1. Get temperature rise by calculation the difference (water temperature after cooking minus initial temperature) in each bowl.

2. Then calculate average value(t) of both temperature rises in degrees centigrade.

3. Then work out :
Power Output (watt) = 70 x Δt

Where Δt is an Average Temperature Rise in degrees centigrade.

(F) Power Output shall be in the following range :

Average Temperature Rise	Microwave Power Output
Minimum 22.9°F (12.7°C)	889 W
Maximum 29.3°F (16.3°C)	1141 W

(G) Power Output will be influenced by line voltage of power supply. Consequently, correct power output must be measured within 120V AC ± 1 volt while unit is operating.

3. CIRCUIT DIAGRAM

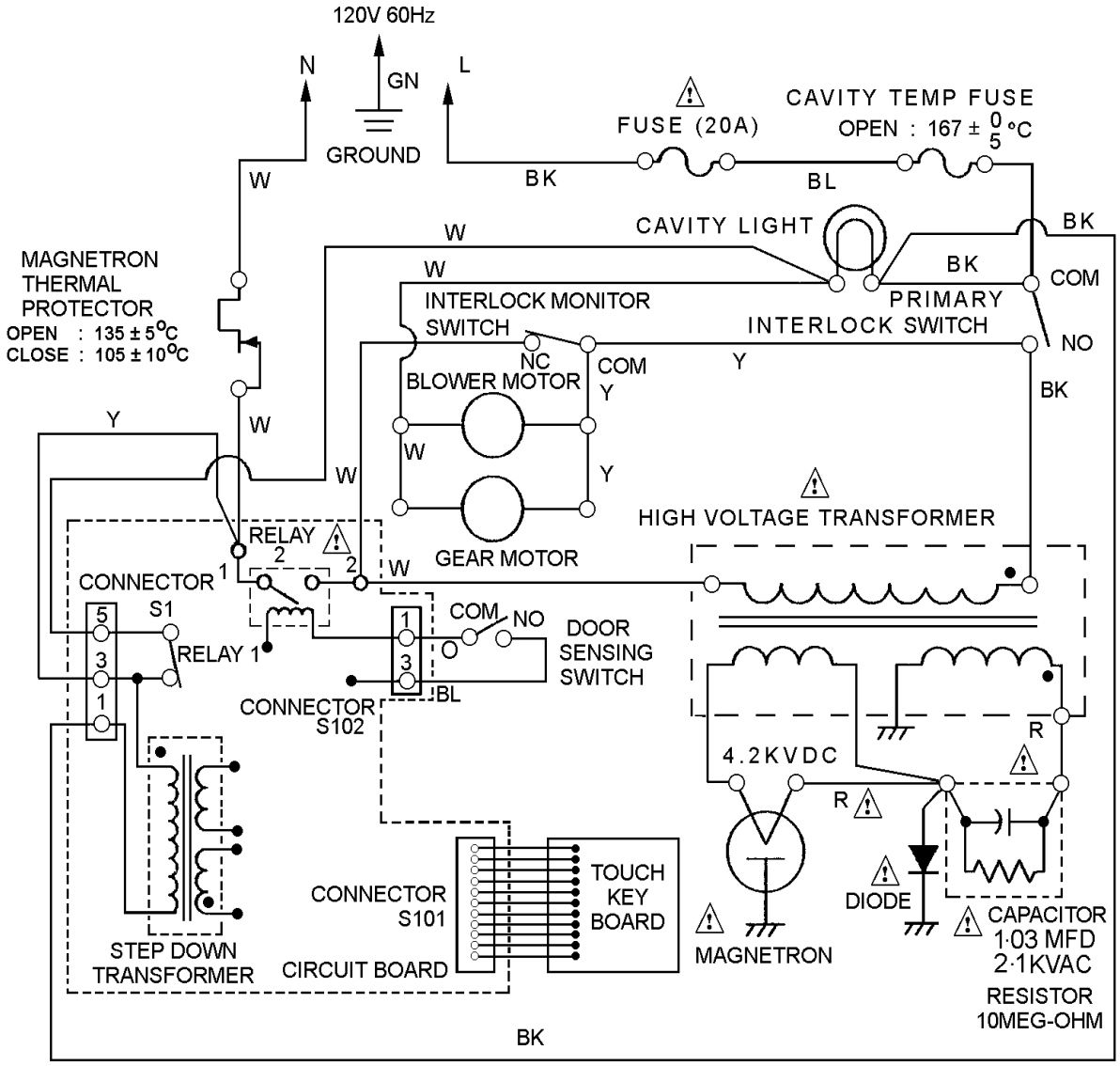


Figure 1

NOTE :
The parts marked with ⚠ have special characteristics of safety, if replace the ⚠ mark parts, use only SANYO specified parts.

WIRING COLOR

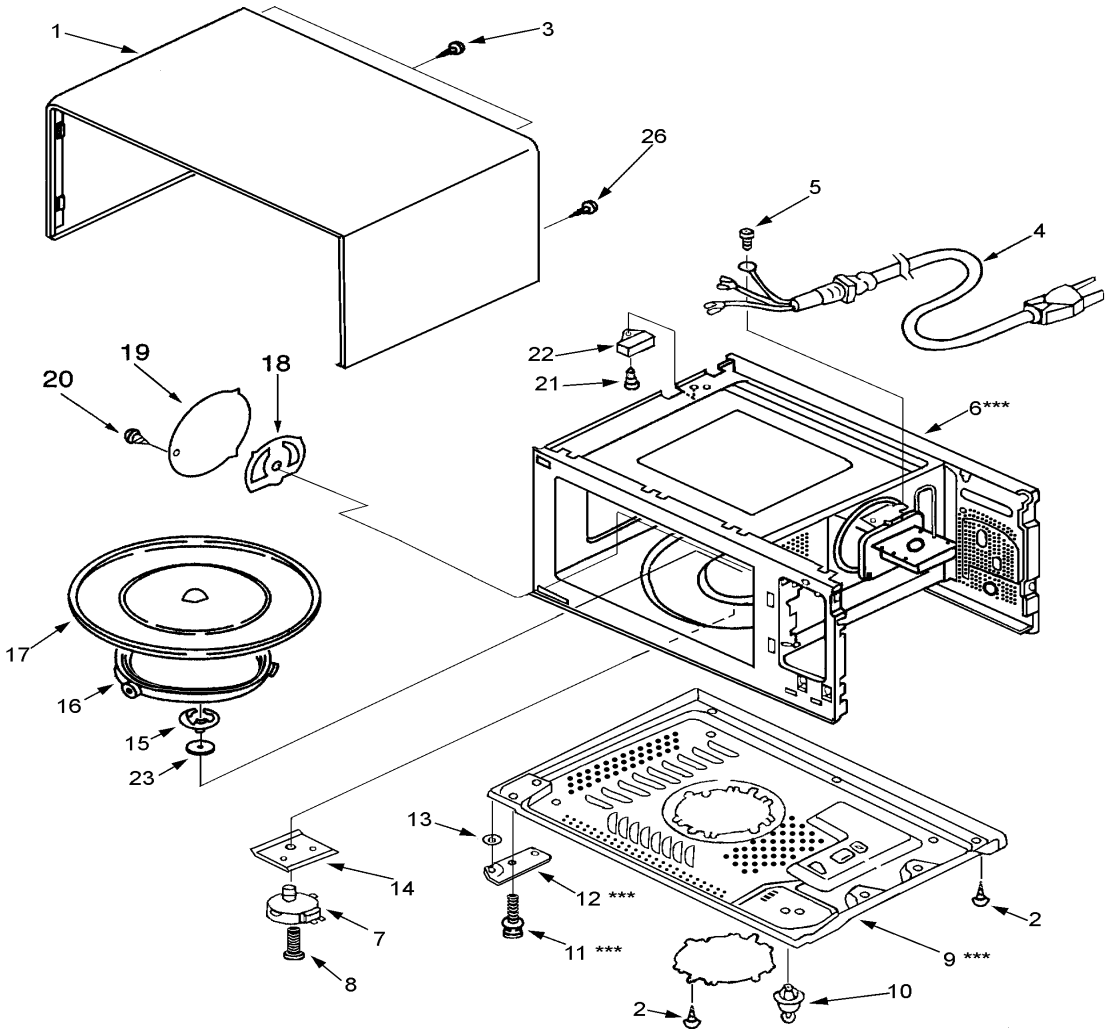
O : ORANGE BK : BLACK

R : RED BL : BLUE

W : WHITE Y : YELLOW

4. EXPLODED VIEW AND PARTS LIST

CAVITY PARTS



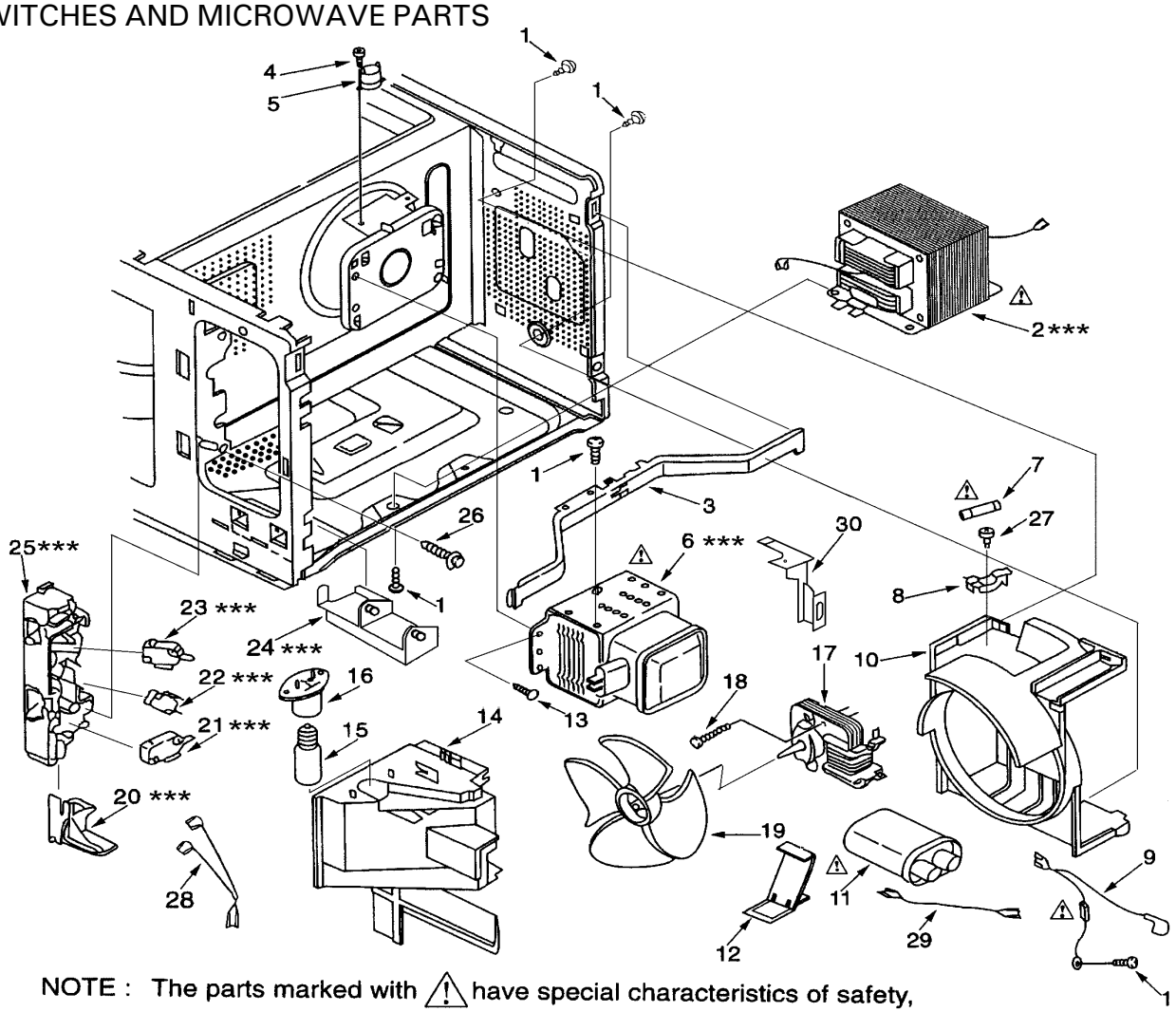
* * * ALL SERVICE ON MICROWAVE OVENS SHOULD BE PERFORMED BY A QUALIFIED TECHNICIAN USING APPROVED TESTING EQUIPMENT. CUSTOMERS SHOULD NOT ATTEMPT TO REPLACE PARTS IDENTIFIED BY A TRIPLE ASTERISK (***).

Key No.	Part No.	Description	Q'ty
1	617 186 5943	Cabinet	1
2	411 082 5201	SCR TPG TRS 4 x 10 Z1	8
3	411 160 6007	SCR TPG TRS + SRT 4 x 10 Z1	3
4	617 216 8913	Power Cord	1
5	411 160 6106	SCR S-T TRS + SRT 4 x 10 Z1	1
6	617 200 5126	Oven Cavity*** (Not Service Part)	1
7	617 124 1068	Gear Motor	1
8	411 010 5808	SCR EVR PAN 4 x 10 Z1	2
9	617 144 4568	Bottom Plate*** (Not Service Part)	1
10	617 221 6089	Plastic Foot with Canoe Clip	4
11	411 011 0802	Bolt Hex + SW + W5 x 14 Z1***	2
12	617 174 9007	Hinge, Lower***	1
13	411 089 2500	Washer F 5 x 10 x 0.8	1

Key No.	Part No.	Description	Q'ty
14	617 120 8481	Insulation Sheet	1
15	617 144 4476	Turn Table Shaft	1
16	617 199 1048	Roller Base Assy	1
17	617 201 2704	Rotating Tray	1
18	617 214 8304	Antenna Complete	1
19	617 162 1938	Cavity Cover	1
20	411 069 1707	SCR TPG TRS 4 x 6 DA	1
21	411 006 6604	SCR TPG PAN 3 x 6 Z1	1
22	617 200 0381	Thermal Fuse 167°C	1
23	617 080 5315	Special Washer	1
24			
25			
26	617 208 4176	Special Screw	2

Note : Screws securing Cabinet cannot be removed by regular screwdriver.
KEY NO. 26. SPECIAL SCREW REQUIRES SPECIAL DRIVER
(PART NO. 617 209 3734) OR SPECIAL BIT (PART NO. 617 209 3741)

SWITCHES AND MICROWAVE PARTS



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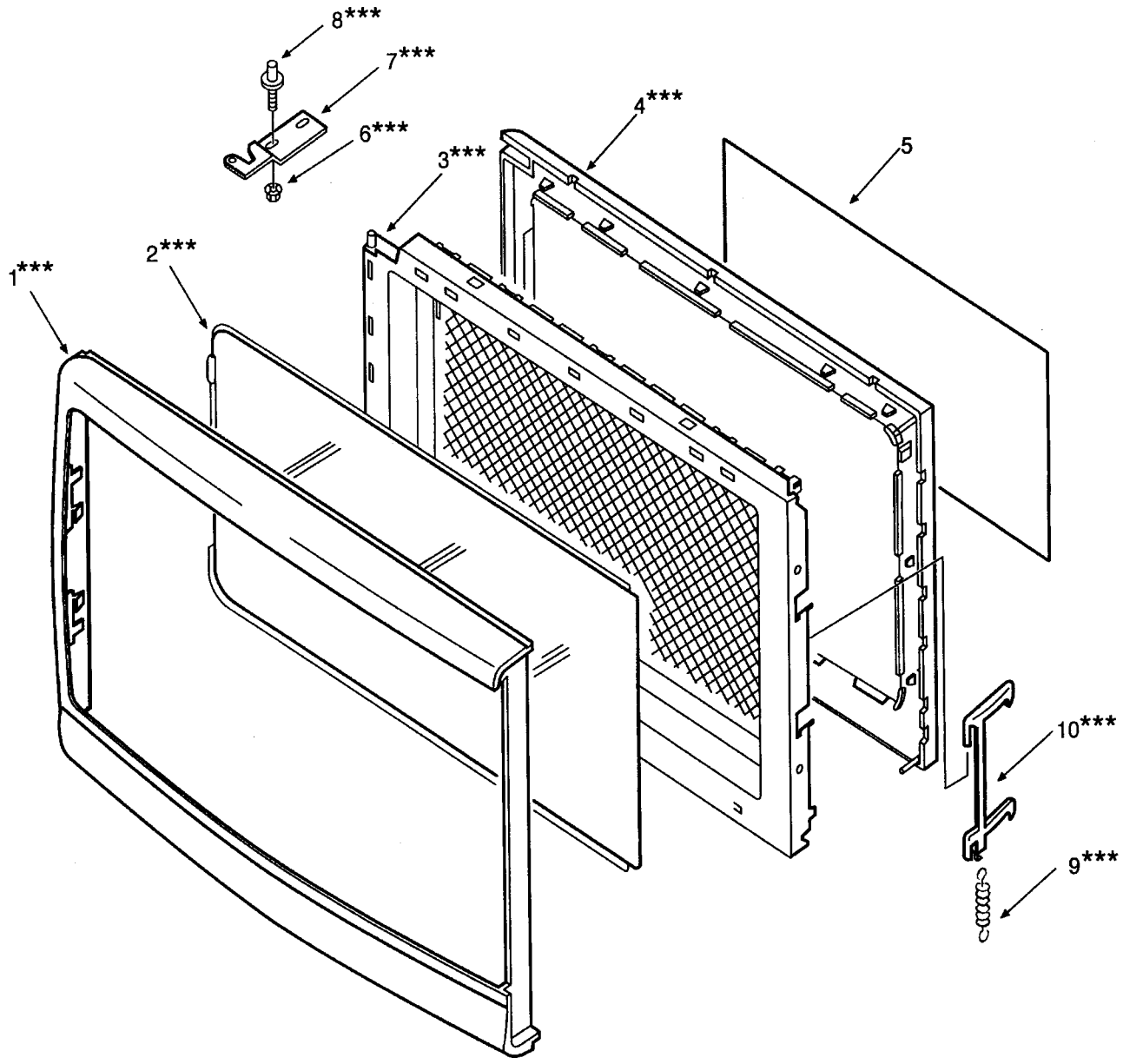
Key No.	Part No.	Description	Q'ty
1	411 082 5201	SCR TPG TRS 4 x 10 Z1	9
2	617 213 6936	H.V. Transformer,*** N6T-P691 120V 60Hz	1
3	617 162 1945	Stay, Cavity & Magnetron	1
4	411 006 6604	SCR TPG PAN 3 x 6 Z1	1
5	617 129 1001	Thermostat, Magnetron 135°C	1
6	415 002 3308	Magnetron, 2M247H(B)***	1
7	423 021 3704	Fuse, 250V 20A	1
8	617 137 8269	Fuse Holder	1
9	617 201 6382	Lead Wire Ass'y (including Diode)	1
10	617 162 1990	Blower Base	1
11	617 205 1840	H.V Capacitor including Resistor, 1.03uf 2.1KV	1
12	617 182 2373	Capacitor Band	1
13	411 011 5609	Bolt Hex 4 x 10 Z1	4
14	617 198 4996	Duct, Mag. Exhaust	1
15	617 188 0205	Lamp, 120V 20W	1
16	617 124 1280	Lamp Socket	1

Key No.	Part No.	Description	Q'ty
17	617 197 7417	Blower Motor	1
18	411 082 5201	SCR TPG TRS 4 x 10 Z1	2
19	617 196 8507	Blower Fan	1
20	617 245 6256	Latch Lever***	1
21	617 152 4741	Micro Switch,*** Primary Interlock V-5930D	1
22	617 004 5575	Micro Switch,*** Interlock Monitor V-5220DZ	1
23	617 152 4741	Micro Switch,*** Door Sensing V-5930D	1
24	617 124 1198	Latch Lever,***	1
25	617 245 6096	Lever Stopper***	1
26	411 102 5907	SCR ETG TRS 4 x 10 N2	2
27	411 129 5805	SCR TPG BIN 3 x 10 Z1	1
28	617 117 3505	Harness, Door Sensing	1
29	617 124 2300	Lead Wire Ass'y	1
30	617 214 8328	Duct, Mag. Intake	1

DOOR PARTS



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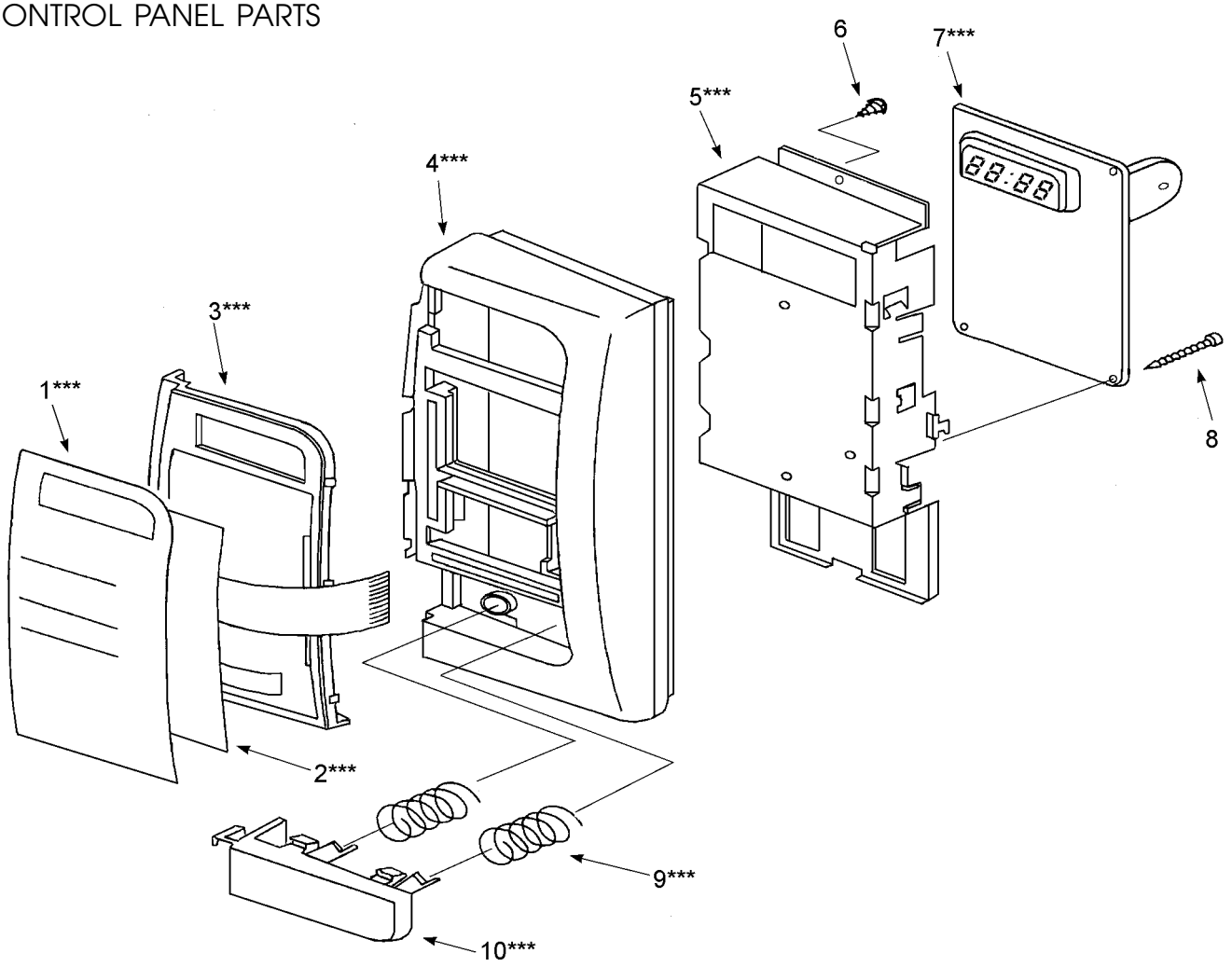
Key No.	Part No.	Description	Q'ty
1	617 171 5026	Door Cover***	1
2	617 199 5351	Door Panel***	1
3	617 199 2373	Door Main Frame*** (Also order Door Sheet when replacing Door Main Frame)	1
4	617 144 4643	Choke Dielectric***	1

Key No.	Part No.	Description	Q'ty
5	617 144 4636	Door Sheet	1
6	411 054 1903	Nut Hex + Flg W / SRT 5***	2
7	617 124 0955	Hinge, Upper***	1
8	411 011 0802	Bolt Hex + SW + W 5 x 14***	2
9	617 101 1494	Spring***	1
10	617 179 2478	Door Latch***	1

CONTROL PANEL PARTS



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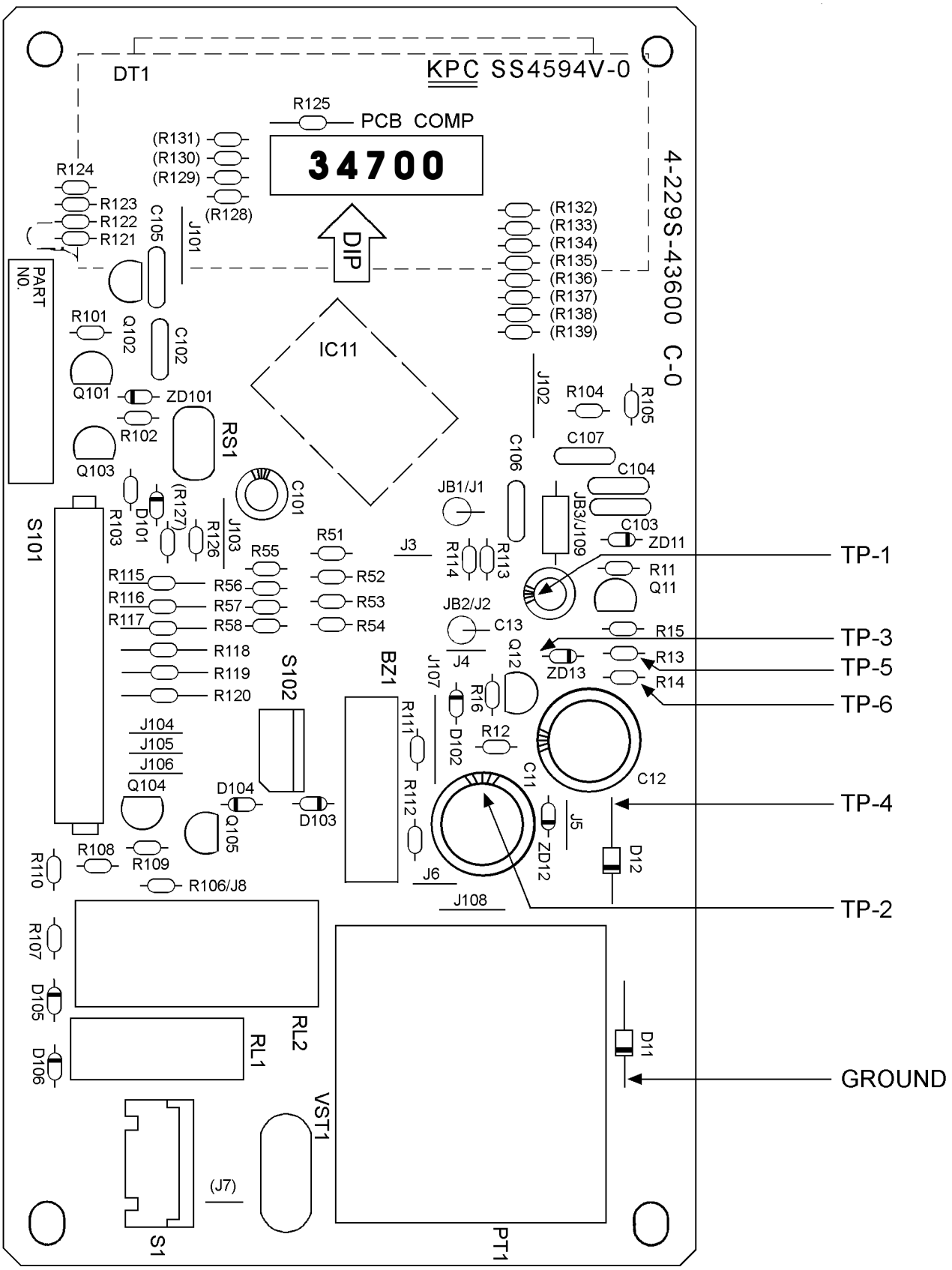
Key No.	Part No.	Description	Q'ty
1	617 222 1434	Control Sheet*** (Also order Touch Key Board when replacing Control Sheet)	1
2	617 219 4608	Touch Key Board*** (Also order Control Sheet when replacing Touch Key Board)	1
3	617 186 2737	Control Plate***	1

Key No.	Part No.	Description	Q'ty
4	617 171 5828	Control Frame***	1
5	617 144 4780	Control Base***	1
6	411 160 6205	SCR TPG TRS+SRT 4 x 10 Z1	1
7	617 221 5518	Power & Control Circuit Board***	1
8	411 129 5805	SCR TPG BIN 3 x 10 Z1	2
9	617 080 9559	Spring, Door Release Lever***	2
10	617 186 2706	Door Release Lever***	1

PRINTED MATTER (Items Not Illustrated)

Key No.	Part No.	Description	Q'ty
	617 220 9562	Operating Instructions (English / Spanish)	1
	617 223 5004	Carton Box Complete	1
	617 223 4960	Name Plate	1

CONTROL CIRCUIT BOARD
(Part No. **617 221 5518**)

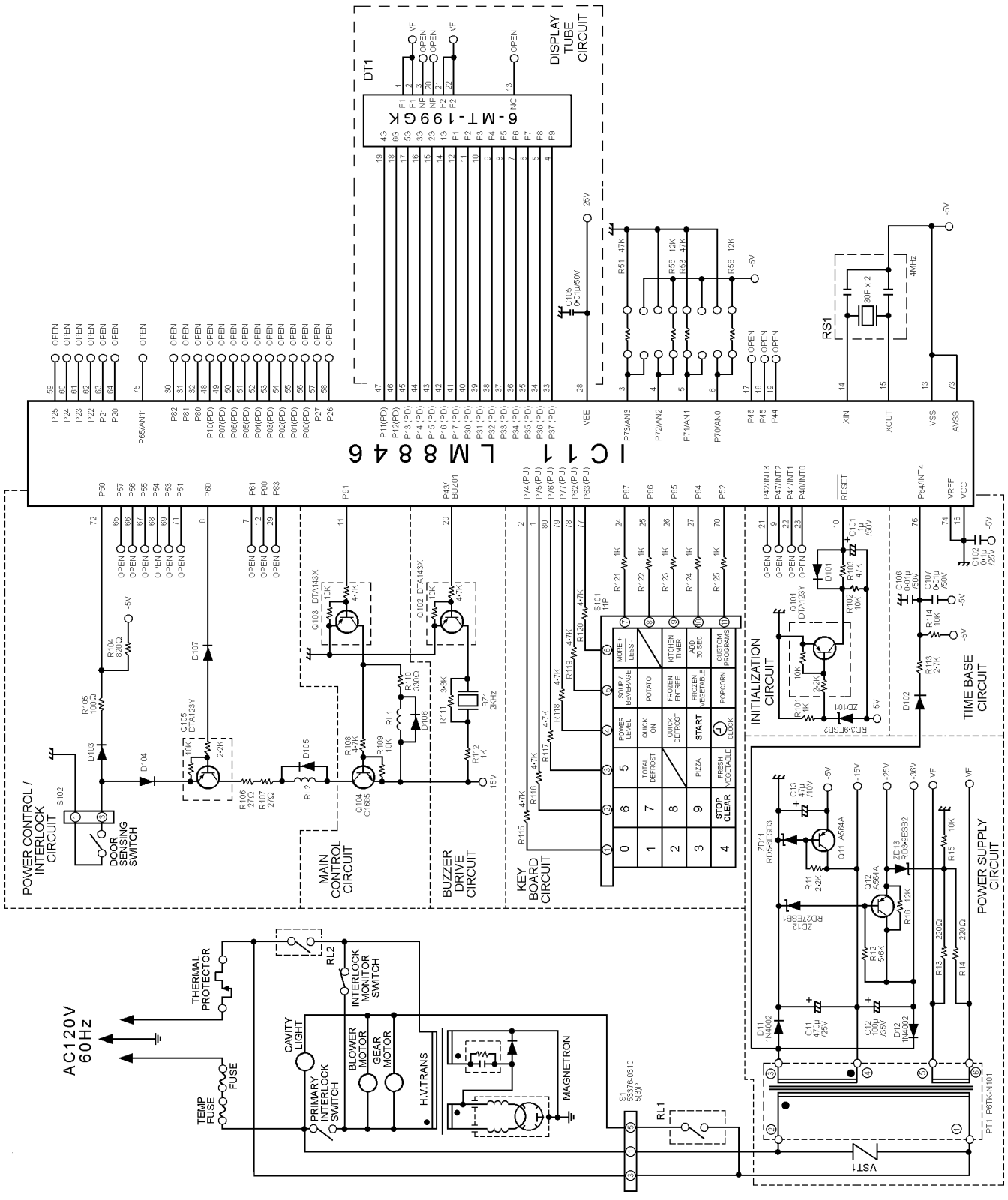


CONTROL CIRCUIT BOARD
(Part No. **617 221 5518**)

Key No.	Order Part No.	Description	Q'ty
INTEGRATED CIRCUIT.			
IC11	409 452 0901	IC LM8846-124FP	1
TRANSISTORS.			
Q104	405 011 8401	2SC1740S-Q-TP	1
Q101, 105	405 082 4609	DTA123YS-TP	2
Q11, 12	405 004 3000	2SA564A-Q-T93	2
Q102, 103	405 000 1802	DTA143XS-TP	2
DIODES.			
D11, 12	407 012 0200	IN4002-TP	2
D101 ~ 107	407 012 4406	ISS133-TP	7
ZD101	407 132 2306	HZS3.9NB2	1
ZD11	407 057 0500	RD5.6ESB3	1
ZD12	407 160 6703	RD27ESB1	1
ZD13	407 132 2306	HZS3.9NB2	1
CAPACITORS.			
C103 ~ 107	403 069 8305	Ceramic, 0.01mfd, ± 5%, 50V.	5
C102	403 002 4708	Ceramic, 0.1mfd, ± 5%, 25V.	1
C101	403 147 8807	Electrolytic, 1mfd, ± 20%, 50V.	1
C13	403 147 8609	Electrolytic, 47mfd, ± 20%, 10V.	1
C12	403 152 7307	Electrolytic, 100mfd, ± 20%, 35V.	1
C11	403 188 8408	Electrolytic, 470mfd, ± 20%, 25V.	1

Key No.	Order Part No.	Description	Q'ty
RESISTORS.			
R105	401 012 4404	Carbon, 100 ohms ± 5%, 1/4W.	1
R101, 112 121 ~ 125	401 012 5609	Carbon, 1K ohms ± 5%, 1/4W.	7
R15, 102, 109, 114	401 012 6903	Carbon, 10K ohms ± 5%, 1/4W.	4
R16, 56, 58	401 013 6308	Carbon, 12K ohms ± 5%, 1/4W.	3
R13, 14	401 016 2505	Carbon, 220 ohms ± 5%, 1/4W.	2
R11	401 016 3700	Carbon, 2.2K ohms ± 5%, 1/4W.	1
R106, 107	401 016 9603	Carbon, 27 ohms ± 5%, 1/4W.	2
R113	401 017 1705	Carbon, 2.7K ohms ± 5%, 1/4W.	1
R110	401 018 2701	Carbon, 330 ohms ± 5%, 1/4W.	1
R111	401 018 3708	Carbon, 3.3K ohms ± 5%, 1/4W.	1
R108, 115 ~ 120	401 020 1907	Carbon, 4.7K ohms ± 5%, 1/4W.	7
R51, 53 103	401 020 2805	Carbon, 47K ohms ± 5%, 1/4W.	3
R12	401 021 2903	Carbon, 5.6K ohms ± 5%, 1/4W.	1
R104	401 023 1607	Carbon, 820 ohms ± 5%, 1/4W.	1
MISCELLANEOUS.			
BZ1	420 000 6800	Buzzer PKM22EPT.	1
VST1	407 118 5505	Varistor ENC 471D-10A.	1
DT1	617 185 3735	Display Tube.	1
RL1	617 201 3978	Relay, G5N-1A-DC12.	1
RL2	617 141 0549	Relay, DU12D1-1PR	1
RS1	617 128 3372	Ceramic Oscillator	1
S1	617 169 4109	Connector.	1
S101	617 126 8959	Connector, 11P.	1
S102	617 111 1392	Connector, 2/3P, Male.	1
PT1	617 178 3933	Step-down Transformer P6TK-N101.	1
2	617 079 4107	Spacer.	1
JB2	617 132 5744	Noise Filter.	1
JB3	617 144 9259	Noise Filter.	1
J1, 3 ~ 6	617 079 4299	Jumper.	5
J101 ~ 108	617 079 4237	Jumper.	8

5. OVERALL CIRCUIT DIAGRAM



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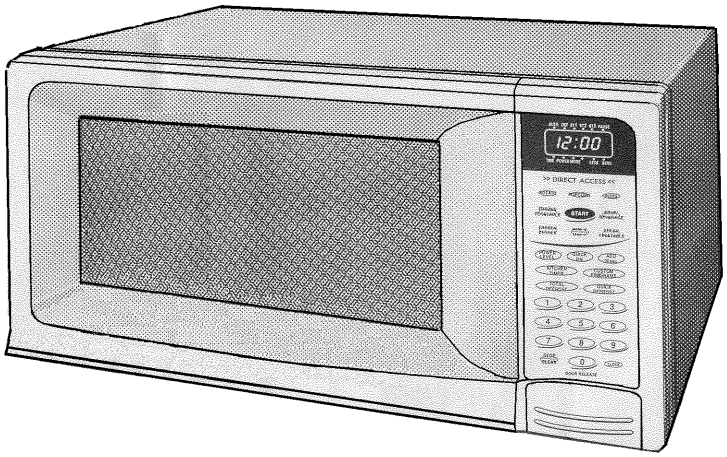

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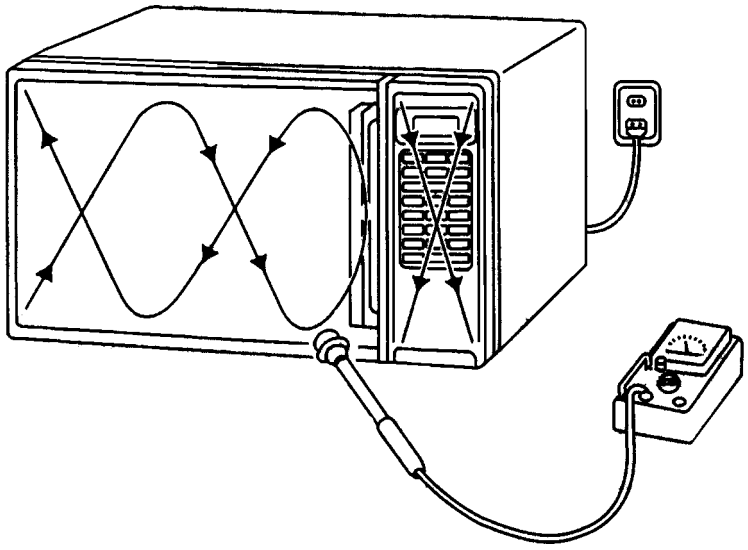

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1. ADJUSTMENT PROCEDURES

TO AVOID POSSIBLE EXPOSURE TO MICROWAVE ENERGY LEAKAGE, THE FOLLOWING ADJUSTMENT OF THE INTERLOCK SWITCHES SHOULD BE MADE ONLY BY AUTHORIZED SERVICE PERSONNEL.

The SANYO service center should have the designated detector to measure the microwave energy leakage after the repair or adjustment.

NOTE : Detector to be used at the service center is NARDA 8100, 8200 or the equivalent.

PRIMARY INTERLOCK SWITCH, INTERLOCK MONITOR SWITCH AND DOOR SENSING SWITCH ADJUSTMENT

(Figure 1)

(1) Loosen 2 screws securing the Lever Stopper.

(2) Adjust the Lever Stopper position so that it is pushed forward and pull backward until there is about zero gap between the Latch Lever and the switch body on the Primary Interlock Switch and at the same time there is about zero gap between the Door Latch and the switch body on the Door Sensing Switch when the Door Latch is securely locked.

(3) Tighten the Lever Stopper screws securely.

(4) Make sure the Interlock Monitor Switch closes after the Primary Interlock Switch opens when the Door is opened very slowly, according to "CHECKOUT PROCEDURE FOR SWITCHES" on page 6.

(5) Make sure the Interlock Monitor Switch opens before the Primary Interlock Switch closes when the Door is closed very slowly, according to "CHECKOUT PROCEDURE FOR SWITCHES" on page 6.

(6) Make sure the microwave energy leakage should be no greater than 4mW/cm^2 to allow for measurement uncertainty when measured with a detector.

(All service adjustments must be made for minimum microwave energy leakage readings.)

NOTE : If the Interlock Monitor Circuit operates and at the same time the fuse blows with the Door opened, be sure to replace the Control Circuit Board because Relay 2 on the Control Circuit Board, the Door Sensing Switch and the electric circuit related on the Door Sensing Switch, which act as Secondary Interlock Switch.

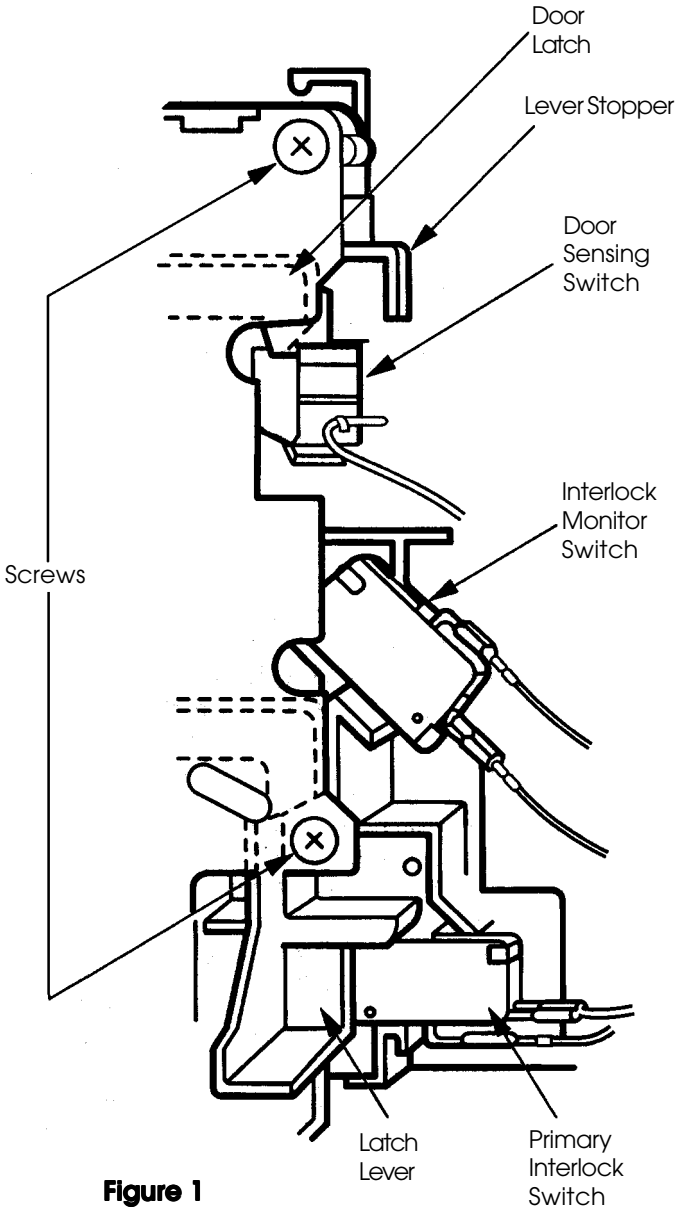


Figure 1

2. SPECIFICATIONS

Rated Power Consumption	1650W.
Microwave Output	1100W.
Frequency	2,450MHz±50MHz.
Power Supply	120V±12V, 60Hz.
Rated Current	14.0 Amp.
Safety Devices	Thermal Fuse open at 332°F (167°C) for Cavity. Thermal Protector open at 252°F (122°C) for Magnetron. Fuse (Cartridge Type 20A) Primary Interlock Switch, Door Sensing Switch and Relay 2. Interlock Monitor Switch.
Timer	Electronic Digital, up to 99 min. 99 sec.
Overall Dimensions	$21\frac{5}{8}$"(W) x 18"(D) x $12\frac{5}{8}$"(H)
Oven Cavity Size	$14\frac{1}{2}$"(W) x $15\frac{7}{8}$"(D) x $9\frac{3}{8}$"(H)
Turn Table Diameter	$12\frac{1}{2}$"
Effective Capacity of Oven Cavity	1.4 Cubic Feet.
Net Weight	Approx. 40 Lbs.

3. POWER OUTPUT MEASUREMENT

NOTE

The power output specification, 1100W on this model is measured with IEC measurement. The power output is measured with two (2) liters water is equivalent to 1100W in measurement with IEC, when measured with the following power output.

(1) Fill two beakers (glass or plastic) with each one liter of tap water (about 20°C) and measure the water temperature. (Use a thermometer with a 1/10 degree gauge).

(2) Place the beakers side by side in the center of the glass tray.

(3) Close the door, set the "TIME" for two minutes. ("200" in the display window). Touch the "START" key and heat the water exactly for two minutes.

(4) Take the beakers out, immediately stir the water and measure the water temperature respectively.

(5) Calculate the temperature rise of water in each beaker. Then calculate the average value of two temperature rises. Output power can be calculated by the equation :

$$\text{Power Output (W)} = 70 \times \Delta t$$

Where Δt is an average temperature rise in degrees Centigrade.

(6) Power Output shall be in the following range :

	Average Temperature Rise	Power Output
Minimum	22.8°F (12.7°C)	889W
Maximum	28.8°F (16.0°C)	1120W

(7) Power Output is affected by the line voltage under load. For correct Power Output measurement, the line voltage under load must be 120±1 volts.

4. PRECAUTIONS AND REPAIR SERVICE TIPS

PRELIMINARY

A. SINCE NEARLY 2,000 VOLTS EXISTS IN SOME CIRCUITS OF THIS MICROWAVE OVEN, REPAIRS SHOULD BE CARRIED OUT WITH GREAT CARE.

B. TO AVOID POSSIBLE EXPOSURE TO MICROWAVE ENERGY LEAKAGE, THE FOLLOWING PRECAUTIONS MUST BE TAKEN BEFORE SERVICING.

(1) Before the power is applied :

(a) Open and close door several times to make sure the primary interlock switch, the interlock monitor switch and the door sensing switch operate properly. (Listen for the clicking sound from the switches). Make sure the interlock monitor switch closes after the primary interlock switch is opens when the door is opened. (See pages 1 and 6).

(b) Make sure the perforated screen and the choke dielectric of the door are correctly mounted.

(2) After the power is applied :

(a) Open and close the door to see if the interlock mechanism operates properly.

(b) Check microwave energy leakage with a leakage detector and confirm the energy leakage should be no greater than 4mW/cm^2 to allow for measurement uncertainty.

(3) Do not operate the unit until it is completely repaired, if any of the following conditions exists :

(a) Door does not close firmly against the cavity front.
(b) The hinge is broken.
(c) The choke dielectric or the door seal is damaged.
(d) The door is bent or warped, or there is any other visible damage to the oven that may cause microwave energy leakage.
NOTE : ***Always keep the seal clean.***

(e) Make sure that there are no defective parts in the interlock mechanism.

(f) Make sure there are no defective parts in the microwave generating and transmission assembly. (especially waveguide).

(4) The following items should be checked after the unit is repaired :

(a) The interlock monitor switch is connected correctly and firmly.

(b) The magnetron gasket on the magnetron is properly positioned.

(c) Waveguide and oven cavity are intact (no leakage of microwave energy).

(d) The door can be properly closed and the safety switches work properly.

(e) The oven must be stopped when the door is opened or the time is up.

The oven must not be operated with any of the above components removed or bypassed.

5. CIRCUIT DIAGRAM

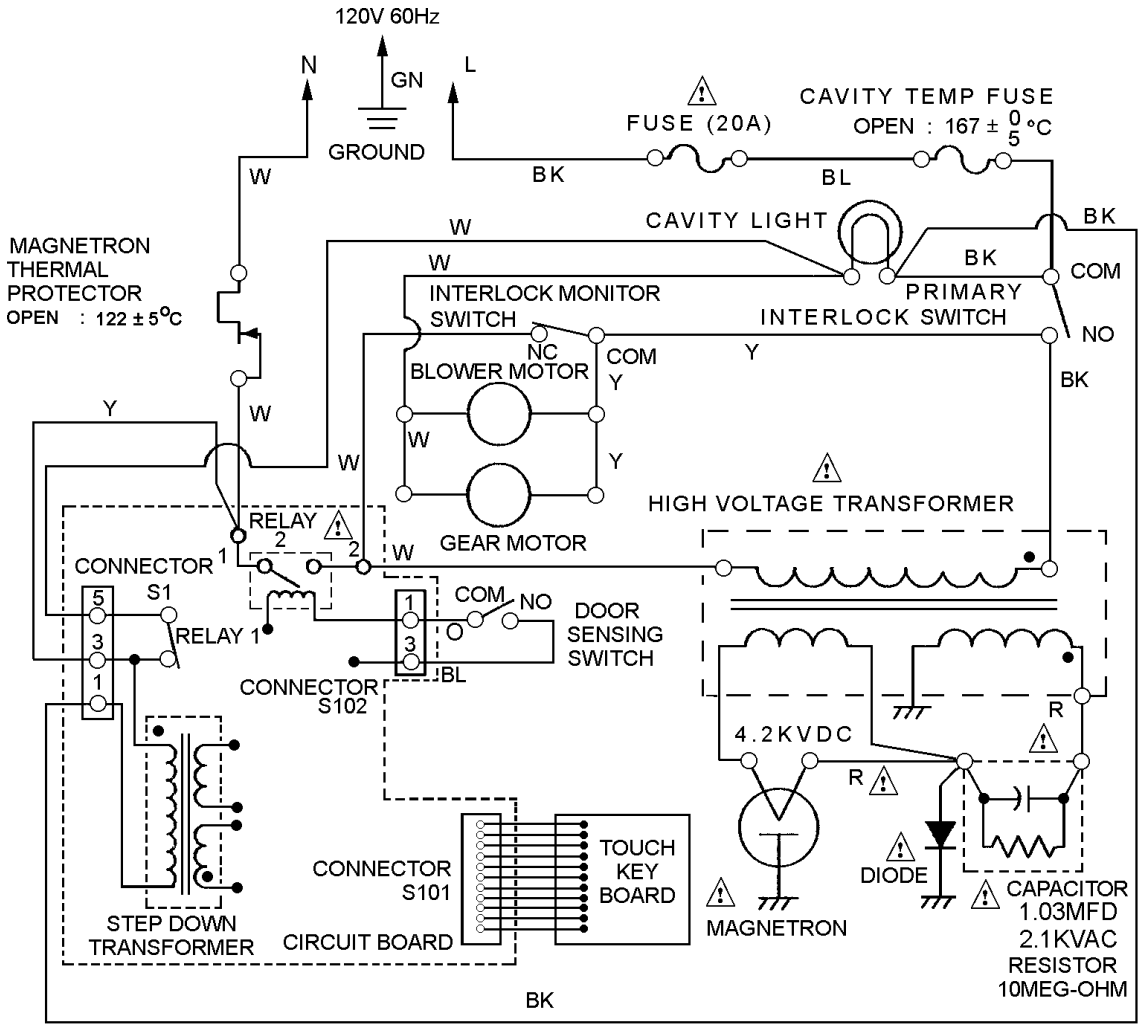


Figure 2

NOTE :

The parts marked with ⚠ have special characteristics of safety, if replace the ⚠ mark parts, use only SANYO specified parts.

WIRING COLOR

BK	:	BLACK
O	:	ORANGE
BL	:	BLUE
W	:	WHITE
Y	:	YELLOW
R	:	RED

			SECONDARY INTERLOCK	
SWITCH MADE ●	PRIMARY INTERLOCK SWITCH	INTERLOCK MONITOR SWITCH	DOOR SENSING SWITCH	RELAY 2
CONDITION	COM	COM	COM	COM
	NO	NC	NO	NO
DOOR OPEN		●		
DOOR CLOSE	●		●	●

6. TEST PROCEDURES AND TROUBLESHOOTING

CAUTION

- DISCONNECT THE POWER SUPPLY CORD FROM THE WALL OUTLET WHENEVER REMOVING THE CABINET FROM THE UNIT, PROCEED WITH THE TESTS ONLY AFTER DISCHARGING THE HIGH VOLTAGE CAPACITOR AND REMOVING THE LEAD WIRES FROM THE PRIMARY WINDING OF THE HIGH VOLTAGE TRANSFORMER. (SEE FIGURE 3)

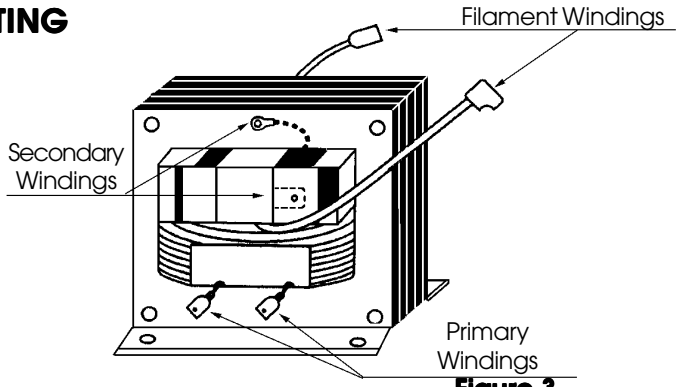
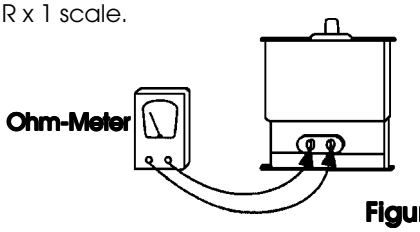
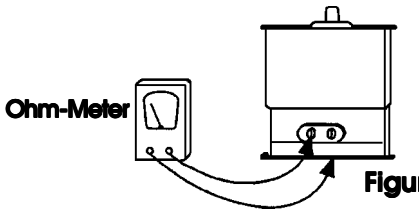
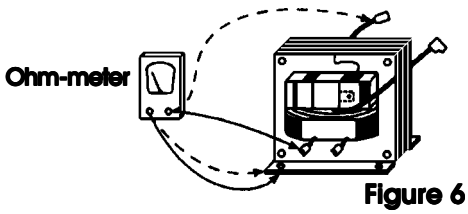


Figure 3

A. TEST PROCEDURES

COMPONENT	CHECKOUT PROCEDURE	RESULT
MAGNETRON	1) Check for resistance : Across the filament terminals of the Magnetron with an Ohm-Meter on R x 1 scale.  **Figure 4**	Normal reading : Less than 1 Ohm.
	2) Check for resistance : Between each filament terminal of the Magnetron and the chassis ground with an Ohm-Meter on highest scale.  **Figure 5**	Normal reading : Infinite Ohms.
HIGH-VOLTAGE TRANSFORMER	1) Measure the resistance : With an Ohm-Meter on R x 1 scale. a. Primary winding : b. Filament winding : c. Secondary winding :	Normal readings : Approximately 0.27 Ohms. Less than 1 Ohm. Approximately 68.9 Ohms.
	2) Measure the resistance : With an Ohm-Meter on highest scale. a. Primary winding to ground. b Filament winding to ground.  **Figure 6** **Note** : Remove varnish of measured point.	Normal readings : Infinite Ohms. Infinite Ohms.

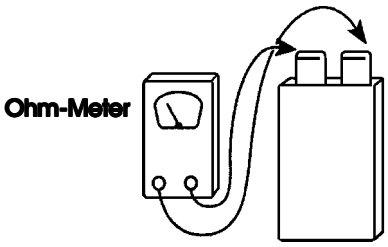
<table>
<tr><th>COMPONENT</th><th>CHECKOUT PROCEDURE</th><th>RESULT</th></tr>
<tr><td>HIGH-VOLTAGE CAPACITOR including BLEEDER RESISTOR</td><td>Measure the resistance : Across two terminals with an Ohm-Meter on highest scale.
 

Figure 7</td><td>Normal reading :
Momentarily indicates several Ohms, and gradually returns to 10 Meg-Ohms.

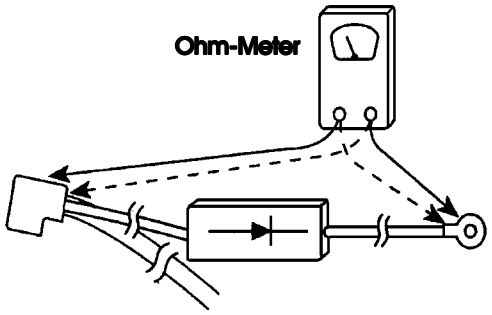
Abnormal reading :
Indicates continuity or 10 Meg-Ohms from the beginning.</td></tr>
<tr><td>HIGH-VOLTAGE DIODE</td><td>Measure the resistance : Across two terminals with an Ohm-Meter on R x 10,000 scale.
 

Figure 8</td><td>Normal reading :
Indicates about the middle position in one direction (forward direction) and infinite Ohms in the reverse direction, using meter which is provided with a 9 volt battery.

<u>NOTE</u>

- Some digital meter may show over even in a forward direction because low measuring voltage of meter does not allow the meter current to pass through the High Voltage Diode.

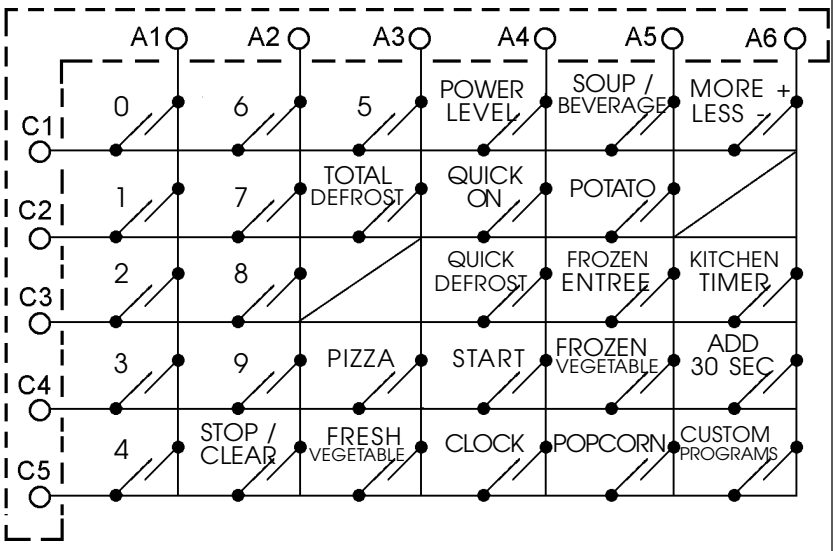
Abnormal reading :
Indicates continuity or infinite Ohms in both directions.</td></tr>
<tr><td>CONTROL CIRCUIT BOARD</td><td>Measure the voltage : Between test point TP-1, TP-2, TP-3 or TP-4 and Ground between TP-5 and TP-6 (See Control Circuit Board on page 19).

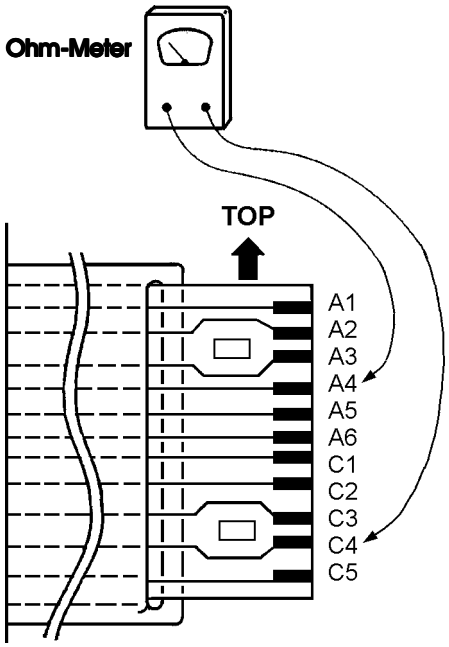
<u>NOTE</u>

- Proceed with the check of the Step-Down Transformer, to see if any one of the measured values is different from the specified values.</td><td><table><tr><td>Test Point</td><td>TP-1</td><td>TP-2</td><td>TP-3</td><td>TP-4</td><td>TP-5 / TP-6</td></tr><tr><td>Voltage</td><td>-5V DC</td><td>-15V DC</td><td>-25V DC</td><td>-36V DC</td><td>2.0V AC</td></tr></table></td></tr>
</table>

COMPONENT	CHECKOUT PROCEDURE	RESULT
TOUCH KEY BOARD	Measure the resistance between terminals of FPC connector after removing it from S101. (Figure 9). **NOTE** - When reconnecting the FPC connector, make sure the holes on the connector are properly inserted in hooks of the plastic fastener in S101.	Resistance value: When touched — Less than 1K Ohms; When not touched — More than 1 MEG Ohms When checking "START" key, connect Ohm-Meter as illustration below.

MATRIX CIRCUIT FOR TOUCH KEY BOARD FPC CONNECTOR



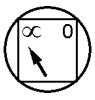
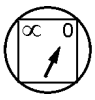
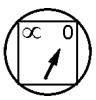


TERMINALS OF FPC CONNECTOR

Figure 9

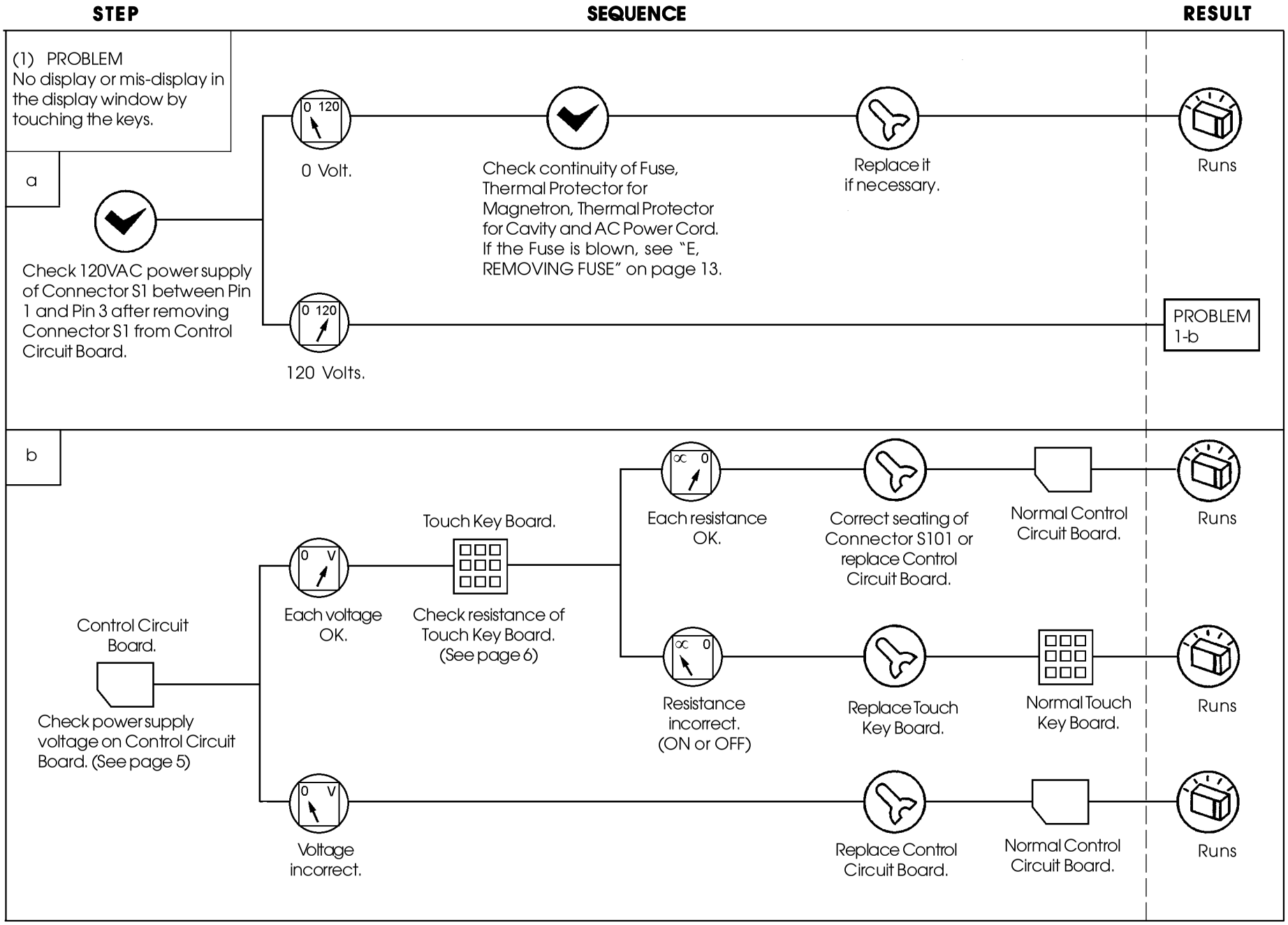
CHECKOUT PROCEDURE FOR SWITCHES

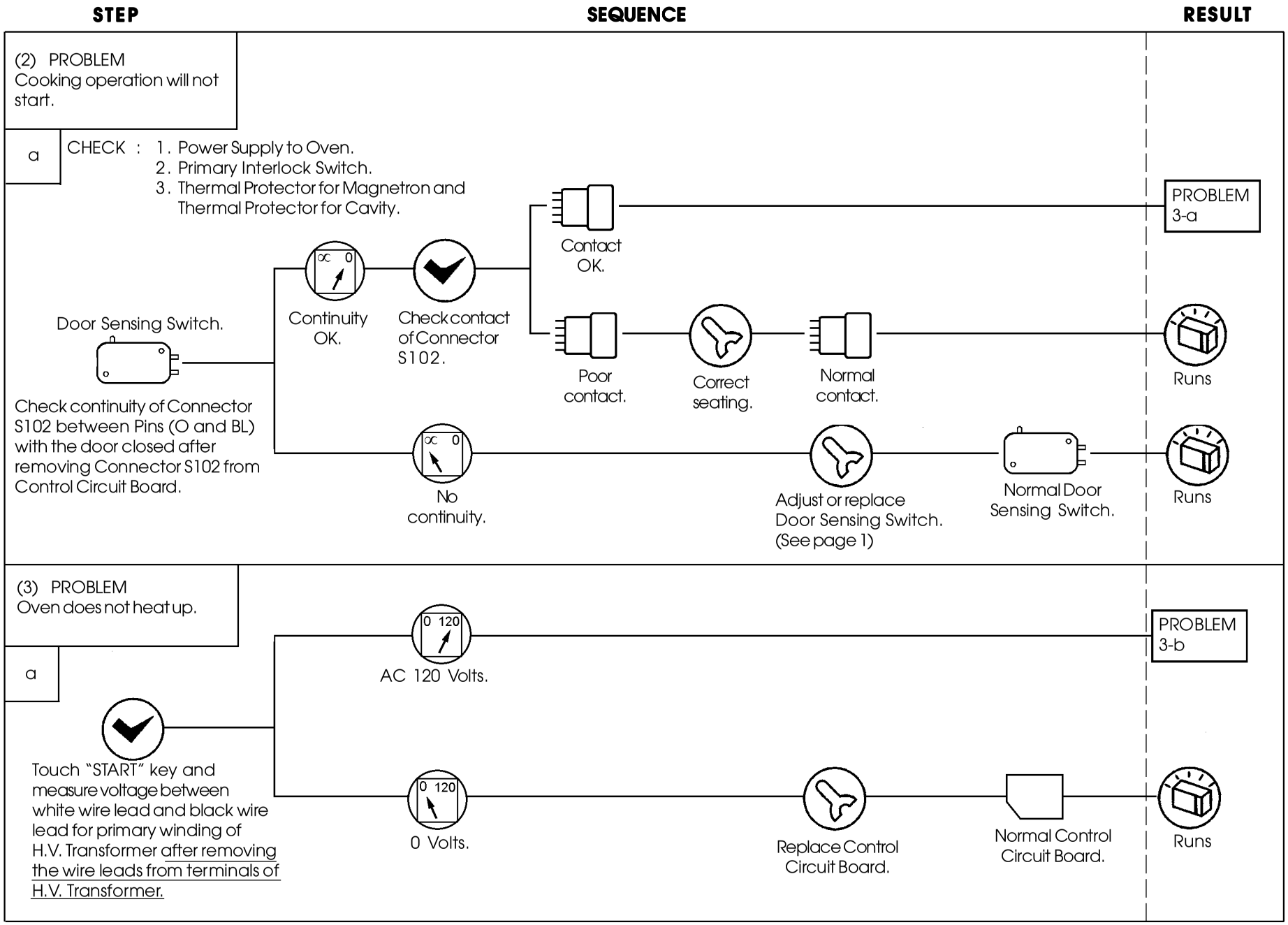
Disconnect the lead wires from the switches and check for the continuity of the switches, connecting an Ohm-Meter to its terminals.

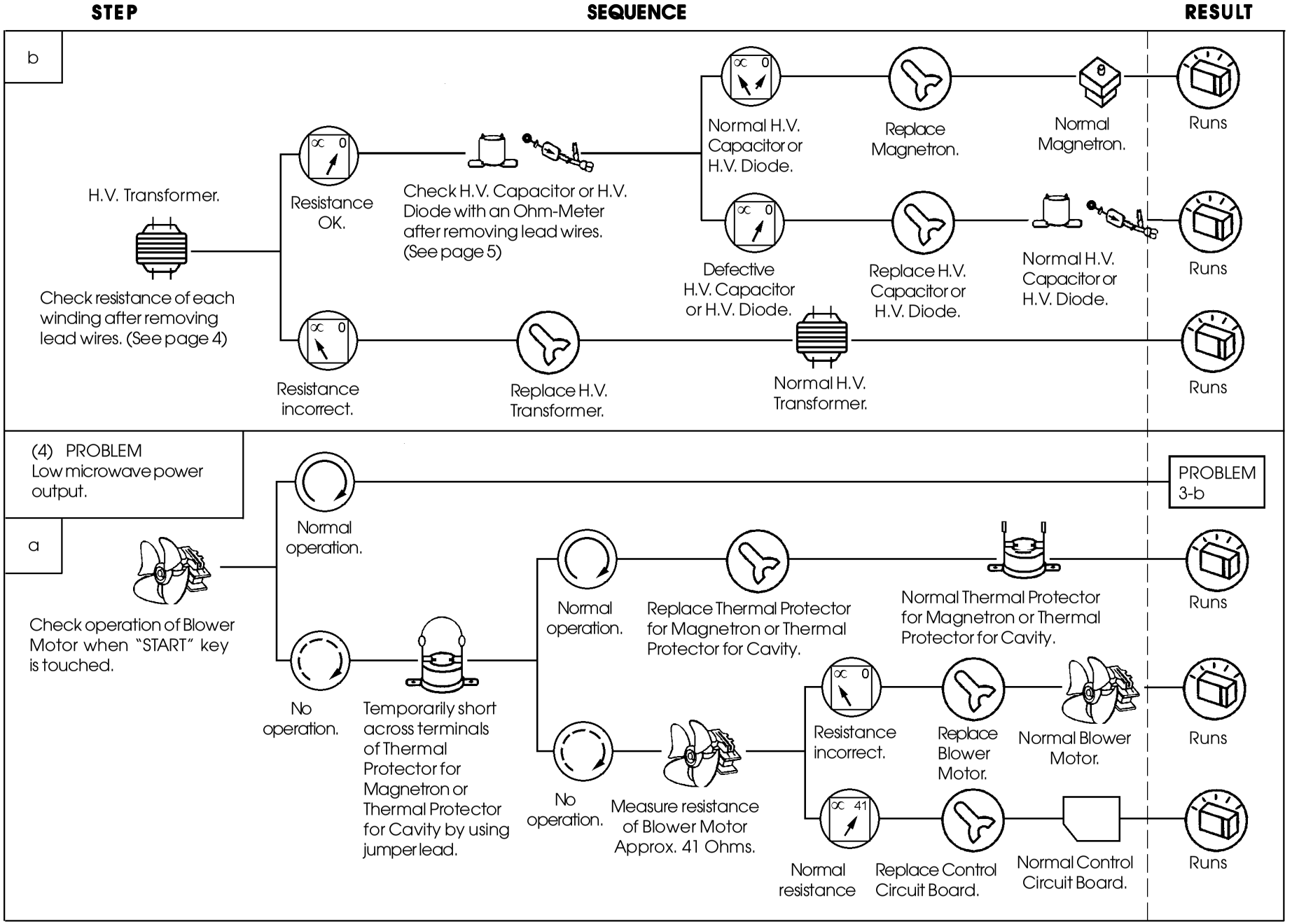
SWITCHES (See Figure 1 on page 1)	CHECKOUT PROCEDURES	DOOR OPEN	DOOR CLOSED
Primary Interlock	Terminals "COM" and "NO"		
Door Sensing			
Interlock Monitor	Terminals "COM" and "NC"		

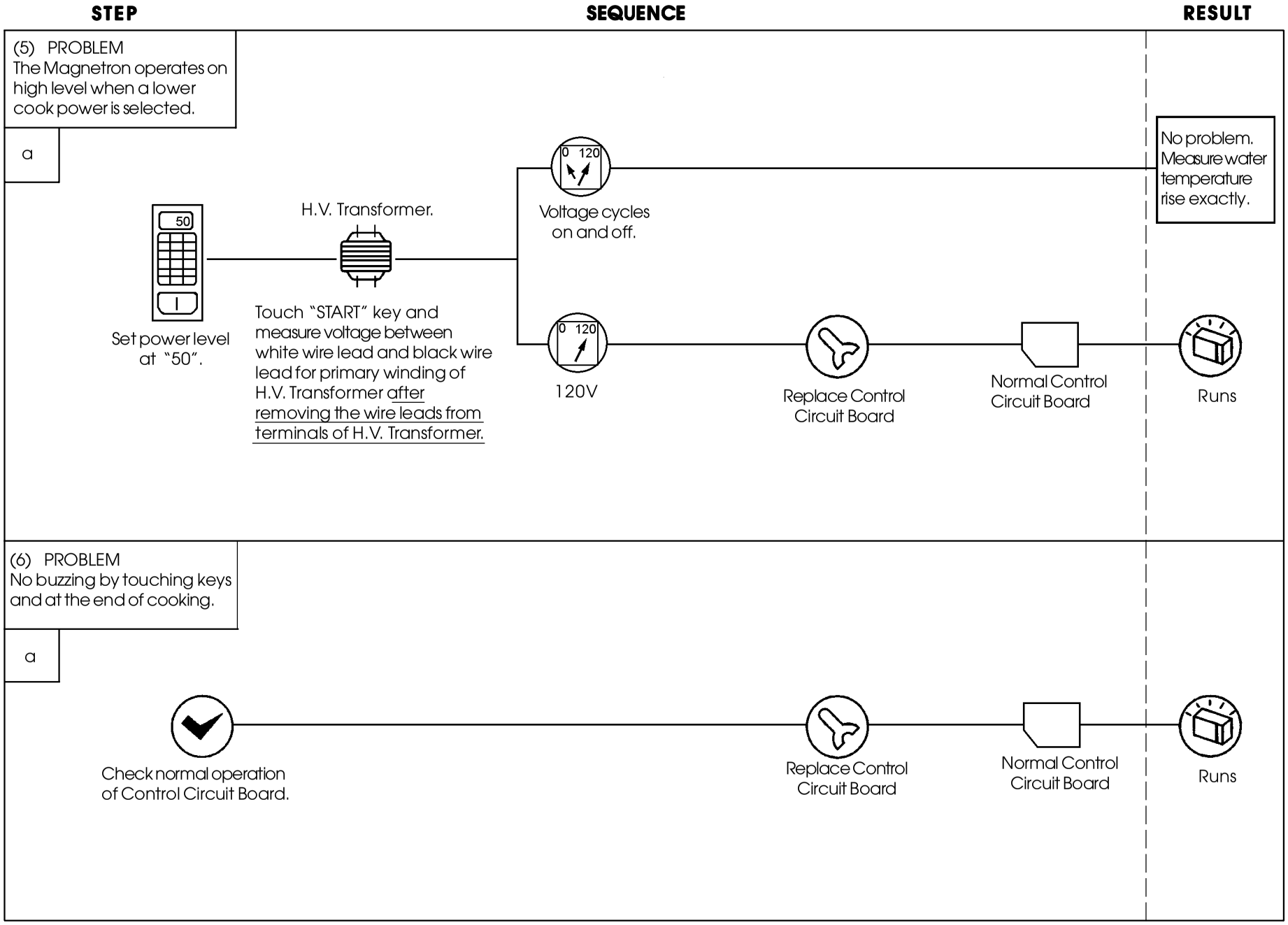
CAUTION : After checking the switches, make sure that the interlock monitor switch is properly connected according to the CIRCUIT DIAGRAM on page 3.

B. TROUBLESHOOTING




STEP
SEQUENCE
RESULT
(2) PROBLEM
Cooking operation will not start.
a
CHECK : 1. Power Supply to Oven.
2. Primary Interlock Switch.
3. Thermal Protector for Magnetron and Thermal Protector for Cavity.
Door Sensing Switch.
Check continuity of Connector S102 between Pins (O and BL) with the door closed after removing Connector S102 from Control Circuit Board.
∞ 0
Continuity OK.
Check contact of Connector S102.
Contact OK.
PROBLEM 3-a
Poor contact.
Correct seating.
Normal contact.
Runs
∞ 0
No continuity.
Adjust or replace Door Sensing Switch. (See page 1)
Normal Door Sensing Switch.
Runs
(3) PROBLEM
Oven does not heat up.
a
Touch "START" key and measure voltage between white wire lead and black wire lead for primary winding of H.V. Transformer after removing the wire leads from terminals of H.V. Transformer.
0 120
AC 120 Volts.
PROBLEM 3-b
0 120
0 Volts.
Replace Control Circuit Board.
Normal Control Circuit Board.
Runs


STEP
SEQUENCE
RESULT
b
H.V. Transformer.
Check resistance of each winding after removing lead wires. (See page 4)
Resistance OK.
Check H.V. Capacitor or H.V. Diode with an Ohm-Meter after removing lead wires. (See page 5)
Normal H.V. Capacitor or H.V. Diode.
Replace Magnetron.
Normal Magnetron.
Runs
Defective H.V. Capacitor or H.V. Diode.
Replace H.V. Capacitor or H.V. Diode.
Normal H.V. Capacitor or H.V. Diode.
Runs
Resistance incorrect.
Replace H.V. Transformer.
Normal H.V. Transformer.
Runs
(4) PROBLEM
Low microwave power output.
a
Check operation of Blower Motor when "START" key is touched.
Normal operation.
PROBLEM 3-b
No operation.
Temporarily short across terminals of Thermal Protector for Magnetron or Thermal Protector for Cavity by using jumper lead.
Normal operation.
Replace Thermal Protector for Magnetron or Thermal Protector for Cavity.
Normal Thermal Protector for Magnetron or Thermal Protector for Cavity.
Runs
No operation.
Measure resistance of Blower Motor Approx. 41 Ohms.
Resistance incorrect.
Replace Blower Motor.
Normal Blower Motor.
Runs
Normal resistance
Replace Control Circuit Board.
Normal Control Circuit Board.
Runs


STEP
SEQUENCE
RESULT
(5) PROBLEM
The Magnetron operates on high level when a lower cook power is selected.
a
50
I
Set power level at "50".
H.V. Transformer.
Touch "START" key and measure voltage between white wire lead and black wire lead for primary winding of H.V. Transformer after removing the wire leads from terminals of H.V. Transformer.
0 120
Voltage cycles on and off.
No problem. Measure water temperature rise exactly.
0 120
120V
Replace Control Circuit Board
Normal Control Circuit Board
Runs
(6) PROBLEM
No buzzing by touching keys and at the end of cooking.
a
Check normal operation of Control Circuit Board.
Replace Control Circuit Board
Normal Control Circuit Board
Runs

7. DISASSEMBLY INSTRUCTIONS

- **OVEN MUST BE DISCONNECTED FROM ELECTRICAL OUTLET WHEN MAKING REPLACEMENTS, REPAIRS, ADJUSTMENTS AND CONTINUITY CHECKS BEFORE PROCEEDING WITH ANY REPAIR WORK. AFTER DISCONNECTING, WAIT AT LEAST 1 MINUTE, UNTIL THE CAPACITOR IN THE HIGH-VOLTAGE AREA HAS FULLY DISCHARGED.**
- **WHEN REPLACING ANY DOOR MICROSWITCH, REPLACE WITH THE SAME TYPE SWITCH SPECIFIED ON THE PARTS LIST.**

A. REMOVING DOOR SENSING SWITCH

(Figures 1 on page 1, 10-a)

(1) Disconnect all wire leads from the Door Sensing Switch. (Figure 1 on page 1)

(2) Remove 2 screws securing the Lever Stopper.

(3) Push the Door Sensing Switch upward while pressing adjacent Upper Switch Stopper of Lever Stopper and Lower Switch Stopper down (Figure 10-a).

(4) Then remove it by lightly pressing the switch toward you (Figure 10-a).

(5) Make necessary adjustments or replacements of the Door Sensing Switch by reversing step (3) and check microwave energy leakage according to "1. ADJUSTMENT PROCEDURES" on page 1, after it is replaced with new one, and check proper operation of it according to "CHECKOUT PROCEDURE FOR SWITCHES" on page 6.

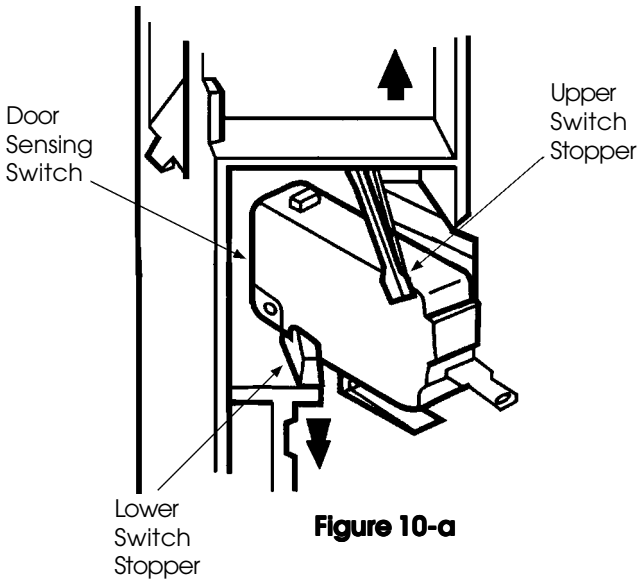


Figure 10-a

B. REMOVING PRIMARY INTERLOCK SWITCH AND INTERLOCK MONITOR SWITCH

(Figure 10-b)

(1) Disconnect all wire leads from Primary Interlock and Interlock Monitor Switch.

(2) Pull the Primary Interlock Switch or Interlock Monitor Switch upward at the same time while pushing the Switch Stoppers to allow a space between the switch body and catches.

(3) Make necessary adjustments or replacement of switch by the reversing step (2) and check micro-wave energy leakage according to "1. ADJUSTMENT PROCEDURES" on page 1, after it is replaced with new one, and check proper operation of it according to "CHECKOUT PROCEDURE FOR SWITCHES" on page 6.

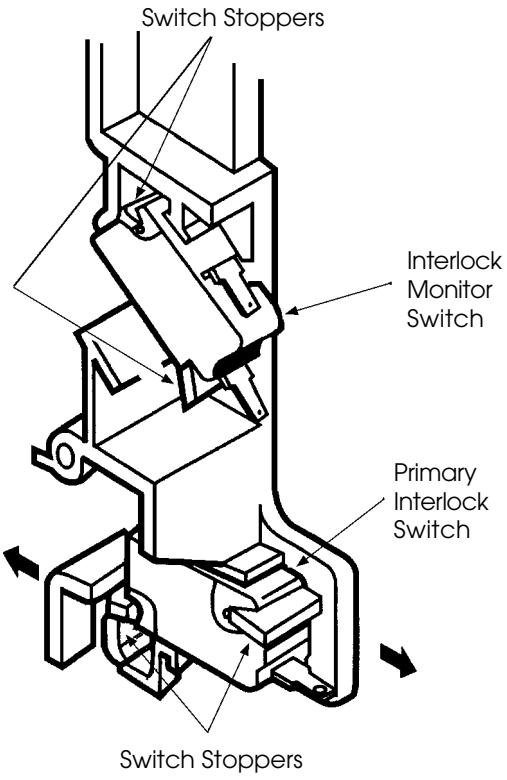


Figure 10-b

Interlock Switch Replacement - when replacing faulty switches, be sure switch mounting tabs are not bent, broken or otherwise deficient in their ability to secure the switches in place.

C. REMOVING BLOWER MOTOR

(Figures 11 (Top View) and 12).

(1) Remove screw securing the stay.

(2) Disconnect all lead wires from the Blower Motor and H.V. Capacitor.

(3) Remove 2 screws securing the Blower Base and disengage 3 hooks from the Rear Plate of Cavity (Figure 12).

(4) Remove 1 screw securing the Blower Motor with the Blower Base.

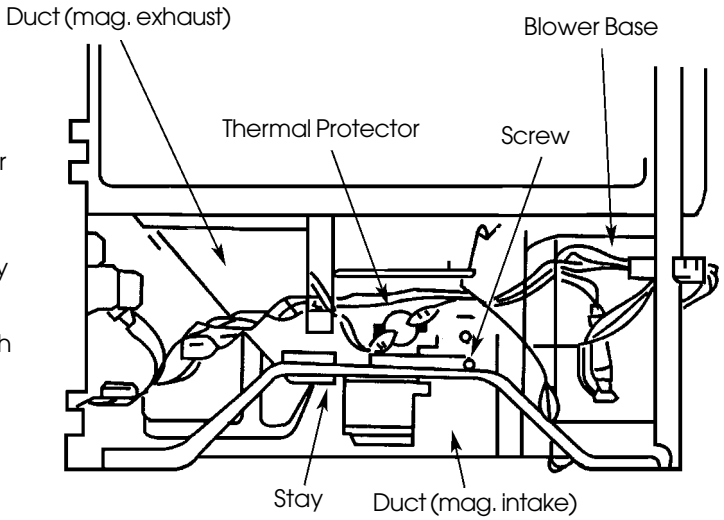


Figure 11 (Top View)

D. REMOVING MAGNETRON

(Figure 11 (Top View))

After removing the Blower Motor :

(1) Remove Duct (mag. exhaust). Remove the screw securing the stay.

(2) Remove 1 screw securing the Thermal Protector.

(3) Disconnect 2 lead wires from the Magnetron.

(4) Remove 4 screws securing the Magnetron to the Waveguide.

(5) Take out Magnetron VERY CAREFULLY.

NOTE

1. When removing the Magnetron from the Cavity or Wave Guide, use a proper care so that the dome of the Magnetron does not hit any adjacent parts of microwave oven.
2. Make sure that the contact face of the Magnetron Gasket is free from any damage or deformation.
3. Adjust the position of the Magnetron properly, so that it correctly sits in place and the Magnetron Gasket is in contact with the mounting rim evenly.
4. While holding the Magnetron under this condition, tighten mounting screws or nuts with your fingers temporarily.
5. Further tighten the screws or nuts with a box wrench, giving one or two turns to each of the screws (or nuts) alternatively so that the Magnetron is mounted on to the bracket uniformly.
6. After replacing the Magnetron, be sure to check the microwave energy leakage with a leakage detector and confirm the leakage is below 4mW/cm^2.

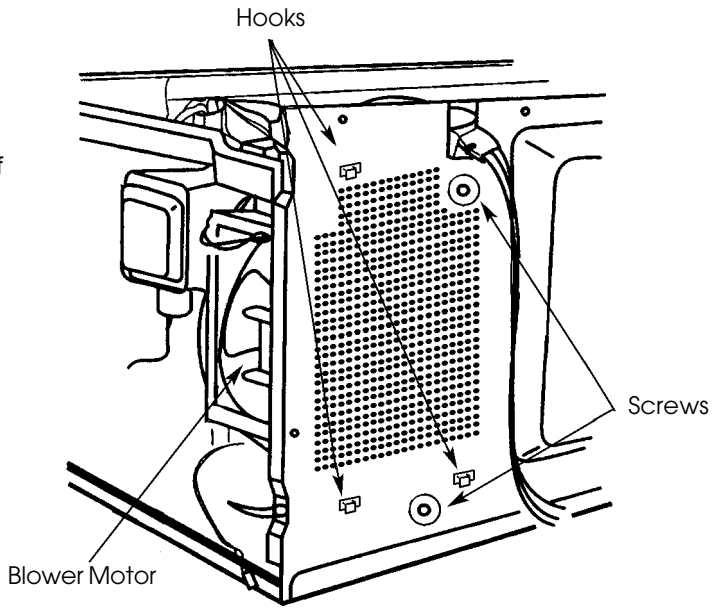


Figure 12

E. REMOVING FUSE

Remove the 20A Fuse with a screwdriver.

NOTE

– When replacing the 20A Fuse, be sure to use an exact repair part.

– If the 20A Fuse blows immediately, check the Primary Interlock Switch, the Relay 2 (on the Control Circuit Board) and the Interlock Monitor Switch according to, **"CHECKOUT PROCEDURE FOR SWITCHES"** on page 6. And make sure to check the microwave energy leakage according to, **"1. ADJUSTMENT PROCEDURES"** on page 1, when the Primary Interlock Switch, the Relay 2 or the Interlock Monitor Switch is adjusted or replaced.

– If the Primary Interlock Switch, the Relay 2 and the Interlock Monitor Switch operate properly, determine which of the following is defective : Control Circuit Board, Blower Motor, High Voltage Transformer, High Voltage Capacitor, High Voltage Diode or Magnetron.

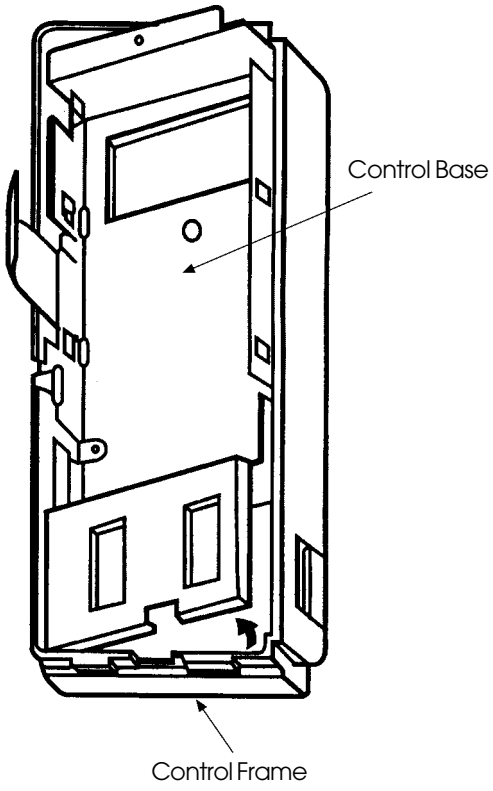


Figure 13

F. REMOVING CONTROL CIRCUIT BOARD

(See exploded view on page 18 and Figure 13)

(1) Remove the Connector S1, S102 and the Connector for the Relay 2 from the Control Circuit Board.

(2) Remove 1 screw securing the Control Panel complete to the Oven Cavity.

(3) Remove the FPC Connector from the Connector S101 while grasping up both lever ends of the plastic fastener.

(4) Remove 2 screws securing the Control Circuit Board to the Control Base.

(5) Lift up the Control Circuit Board from its lower side and take it out from the Control Base.

G. REMOVING TOUCH KEY BOARD

(Figure 14)

After removing the Control Circuit Board :

(1) Remove Control Base while lifting it up at the right side and take it out from the Control Frame.

(2) Remove Control Sheet which is glued to Touch Key Board.

(3) Remove the Touch Key Board which is held on the Control Base Bracket with the adhesive tape.

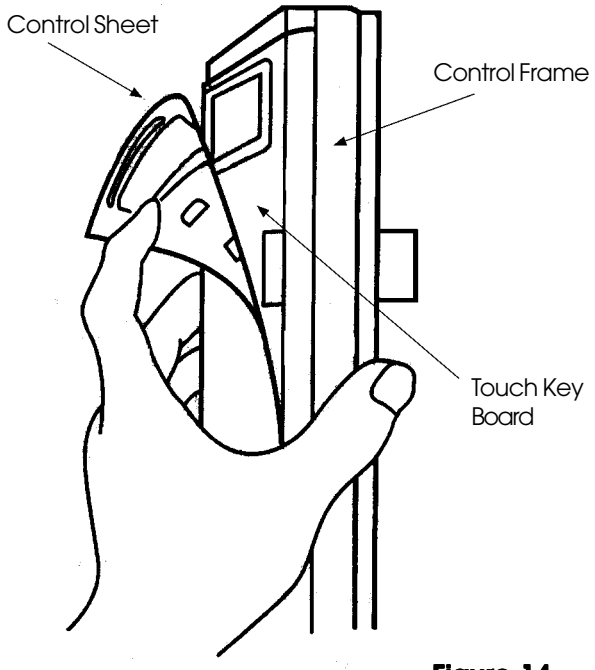


Figure 14

H. REMOVING DOOR

(1) Remove 2 hex nuts securing the upper hinge.

(2) Tilt the top of the Door toward you.

(3) Lift up the Door to remove it.

NOTE

- After replacing the Door, be sure to check that the Primary Interlock Switch, the Door Sensing Switch and the Interlock Monitor Switch operate normally. (See page 1).
- After replacing the Door, check for microwave energy leakage with a leakage detector. Microwave energy leakage must be below the limit of 4mW/cm^2 to allow for measurement uncertainty.

I. DISASSEMBLING DOOR

(Figure 15)

(1) Insert a thin flat-blade screwdriver between the Choke Dielectric and the Door Main Frame and lift up the Choke Dielectric to release hooks one by one. (Figure 15).

(2) Remove the Choke Dielectric.

(3) To detach the Door Cover, insert a thin flat-blade screwdriver between Door Cover and Door Panel and release the projections inside Door Cover.

(4) To detach the Door panel, insert a thin flat-blade screwdriver between the Door Cover and Door Main Frame.

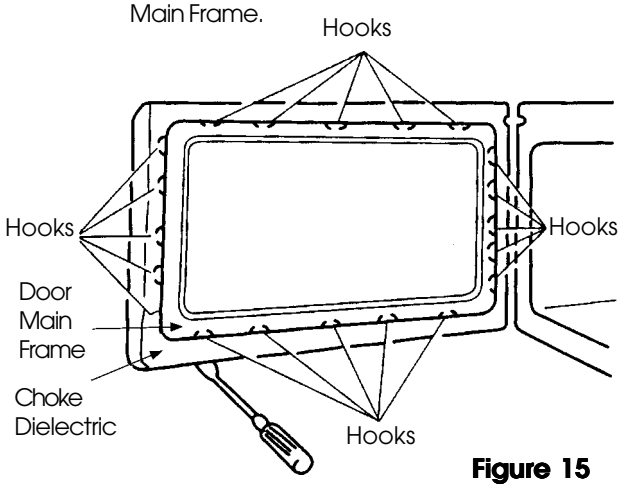


Figure 15

NOTE

- The Choke Dielectric may be damaged when it is removed. When reinstalling it replace it with new ones if it is damaged.
- After installing the Door in place, check for microwave energy leakage with a detector. Microwave energy leakage must be below the limit of 4mW/cm^2 to allow for measurement uncertainty.

J. REMOVING CAVITY COVER

(Figure 16)

(1) Remove a screw from the Cavity compartment.

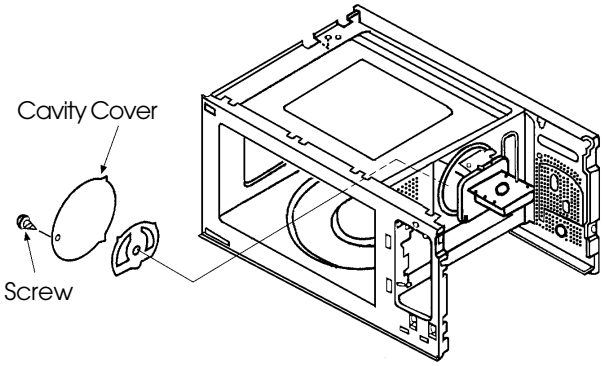


Figure 16

K. REMOVING TURNTABLE MOTOR COVER

(Figure 17)

(1) Turn over the oven on its back.

(2) Cut the 6-joints of the Bottom Plate using diagonal pliers (nipper).

(3) Separate the Motor Cover from Bottom Plate.

(4) Remove 2 screws securing Turntable Motor to the Cavity and take it out.

Note : Bent the cut joints inside slightly for safety and be careful of sharp edge.

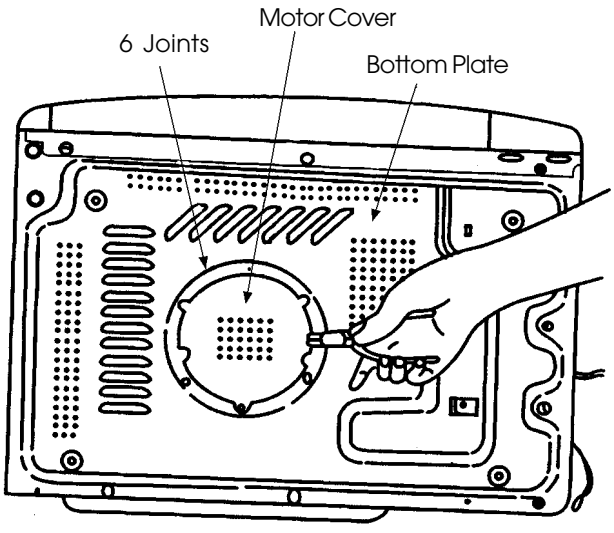
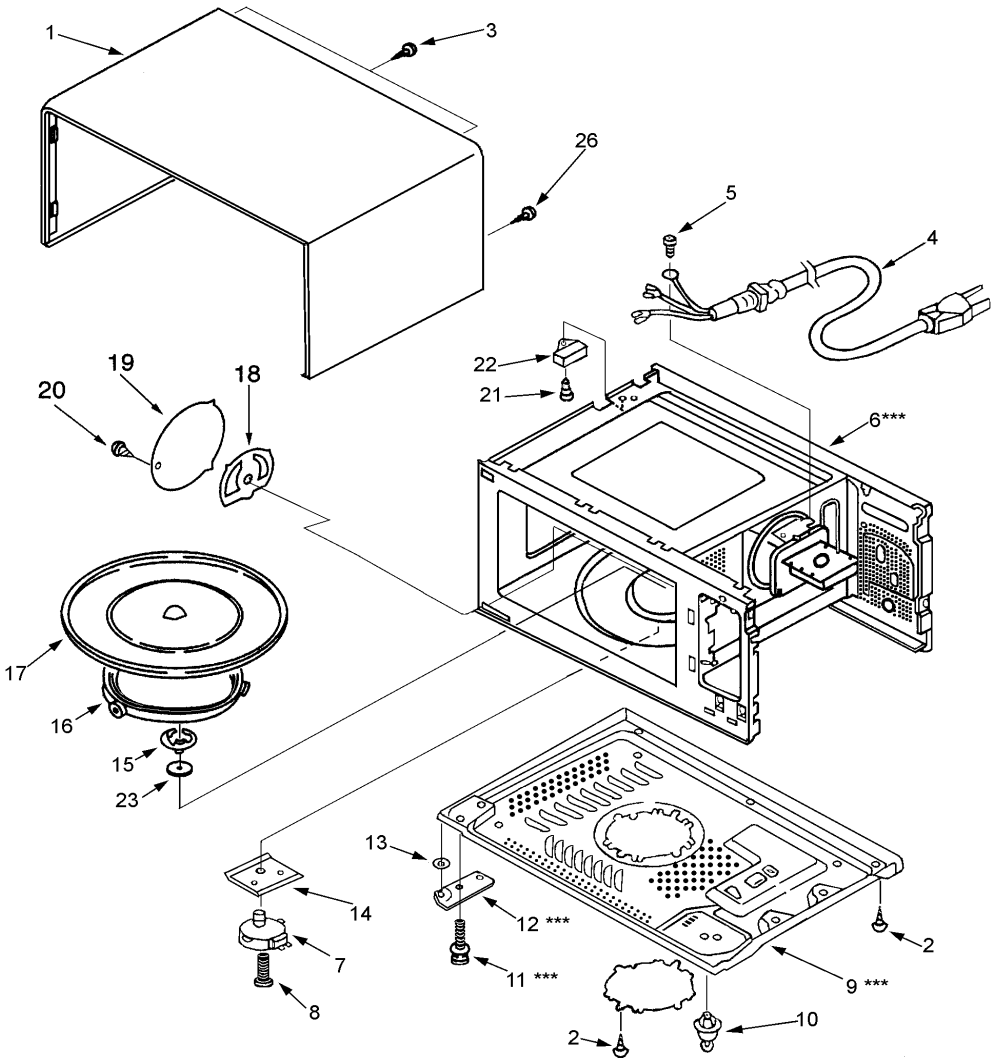


Figure 17

8. EXPLODED VIEW AND PARTS LIST

CAVITY PARTS



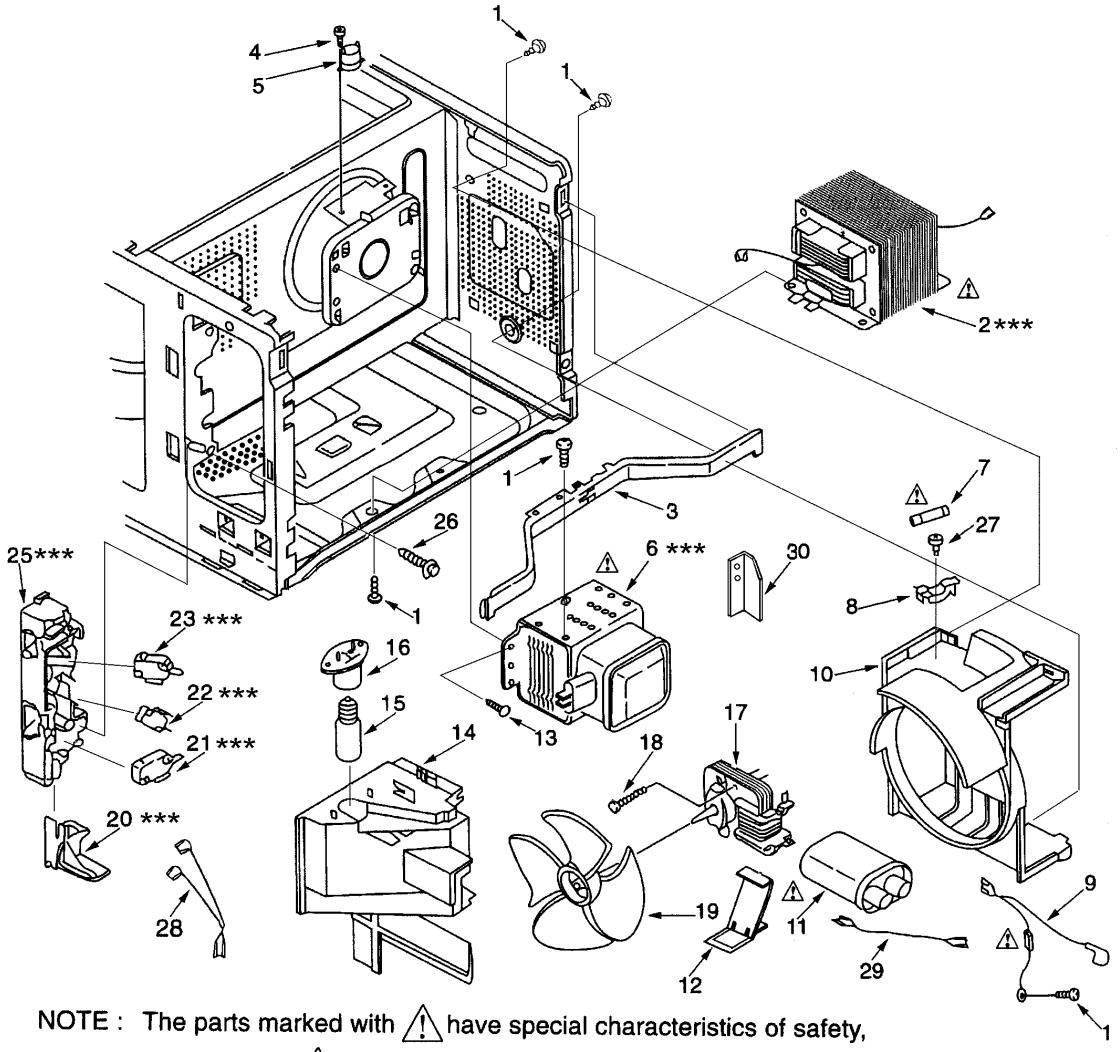
* * * ALL SERVICE ON MICROWAVE OVENS SHOULD BE PERFORMED BY A QUALIFIED TECHNICIAN USING APPROVED TESTING EQUIPMENT. CUSTOMERS SHOULD NOT ATTEMPT TO REPLACE PARTS IDENTIFIED BY A TRIPLE ASTERISK (***).

Key No.	Part No.	Description	Q'ty
1	617 214 9189	Cabinet	1
2	411 082 5201	SCR TPG TRS 4 x 10 Z1	6
3	411 160 6007	SCR TPG TRS + SRT 4 x 10 Z1	2
4	617 171 6863	Power Cord	1
5	411 160 6106	SCR S-T TRS + SRT 4 x 10 Z1	1
6	617 199 2595	Oven Cavity*** (Not Service Part)	1
7	617 124 1068	Gear Motor	1
8	411 010 5808	SCR EVR PAN 4 x 10 Z1	2
9	617 181 5986	Bottom Plate*** (Not Service Part)	1
10	617 221 6089	Plastic Foot with Canoe Clip	4
11	411 011 0802	Bolt Hex + SW + W5 x 14 Z1***	2
12	617 180 6137	Hinge, Lower***	1
13	411 089 2500	Washer F 5 x 10 x 0.8	1

Key No.	Part No.	Description	Q'ty
14	617 120 8481	Insulation Sheet	1
15	617 144 4476	Turn Table Shaft	1
16	617 199 1314	Roller Base Assy	1
17	617 201 2704	Rotating Tray	1
18	617 214 9608	Antenna Complete	1
19	617 162 1938	Cavity Cover	1
20	411 069 1707	SCR TPG TRS 4 x 6 DA	1
21	411 006 6604	SCR TPG PAN 3 x 6 Z1	1
22	617 200 0381	Thermal Fuse 167°C	1
23	617 080 5315	Special Washer	1
24			
25			
26	617 208 4176	Special Screw	2

Note : Screws securing Cabinet cannot be removed by regular screwdriver.
KEY NO. 26. SPECIAL SCREW REQUIRES SPECIAL DRIVER
(PART NO. 617 209 3734) OR SPECIAL BIT (PART NO. 617 209 3741)

SWITCHES AND MICROWAVE PARTS



NOTE : The parts marked with ⚠ have special characteristics of safety, if replace the ⚠ mark parts, use only SANYO specified parts.

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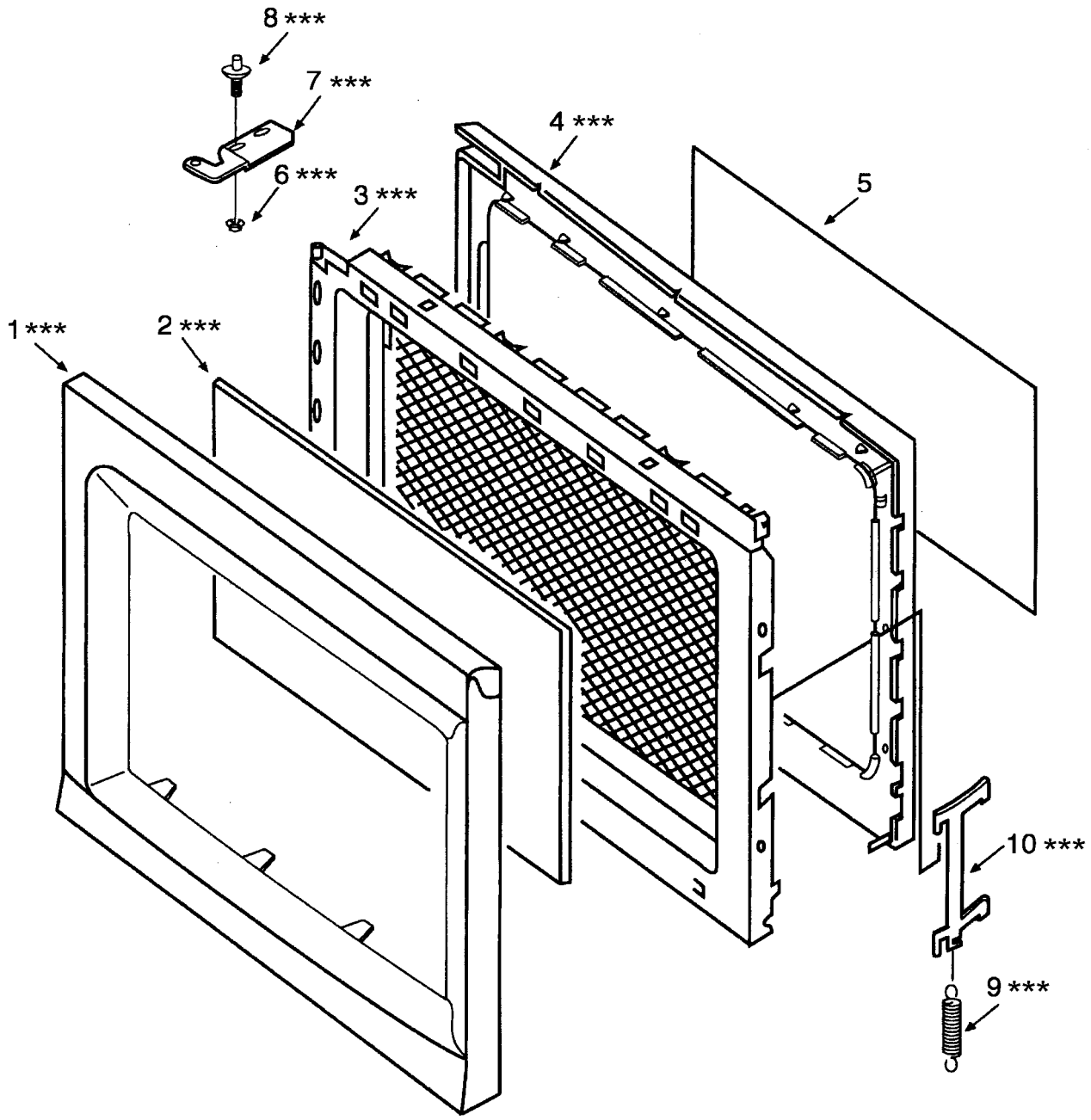
Key No.	Part No.	Description	Q'ty
1	411 082 5201	SCR TPG TRS 4 x 10 Z1	9
2	617 213 6936	H.V Transformer,*** N6T-P691	1
3	617 162 1945	Stay, Cavity & Magnetron	1
4	411 006 6604	SCR TPG PAN 3 x 6 Z1	1
5	617 129 1001	Thermostat, Magnetron 135°C	1
6	415 002 3308	Magnetron, 2M247H(B)-***	1
7	423 021 3704	Fuse, 250V 20A	1
8	617 137 8269	Fuse Holder	1
9	617 201 6382	Lead Wire Ass'y (including Diode)	1
10	617 162 1990	Space Partition (Blower)	1
11	617 205 1840	H.V Capacitor including Resistor, 1.03uf 2.1KV	1
12	617 182 2373	Capacitor Band	1
13	411 011 5609	Bolt Hex 4 x 10 Z1	4
14	617 198 4996	Duct, Mag. Exhaust	1
15	617 188 0205	Lamp, 120V 20W	1
16	617 124 1280	Lamp Socket	1

Key No.	Part No.	Description	Q'ty
17	617 124 1303	Blower Motor	1
18	411 077 2109	SCR TPG BIN 4 x 20 Z1	2
19	617 177 9974	Blower Fan	1
20	617 245 6256	Latch Lever***	1
21	617 152 4741	Micro Switch,*** Primary Interlock V-5930D	1
22	617 004 5575	Micro Switch,*** Interlock Monitor V-5220DZ	1
23	617 152 4741	Micro Switch,*** Door Sensing V-5930D	1
24			
25	617 245 6096	Lever Stopper***	1
26	411 102 5907	SCR ETG TRS 4 x 10 N2	2
27	411 129 5805	SCR TPG BIN 3 x 10 Z1	1
28	617 117 3505	Harness, Door Sensing	1
29	617 124 2300	Lead Wire Ass'y	1
30	617 214 9639	Duct, Mag. Intake	1

DOOR PARTS



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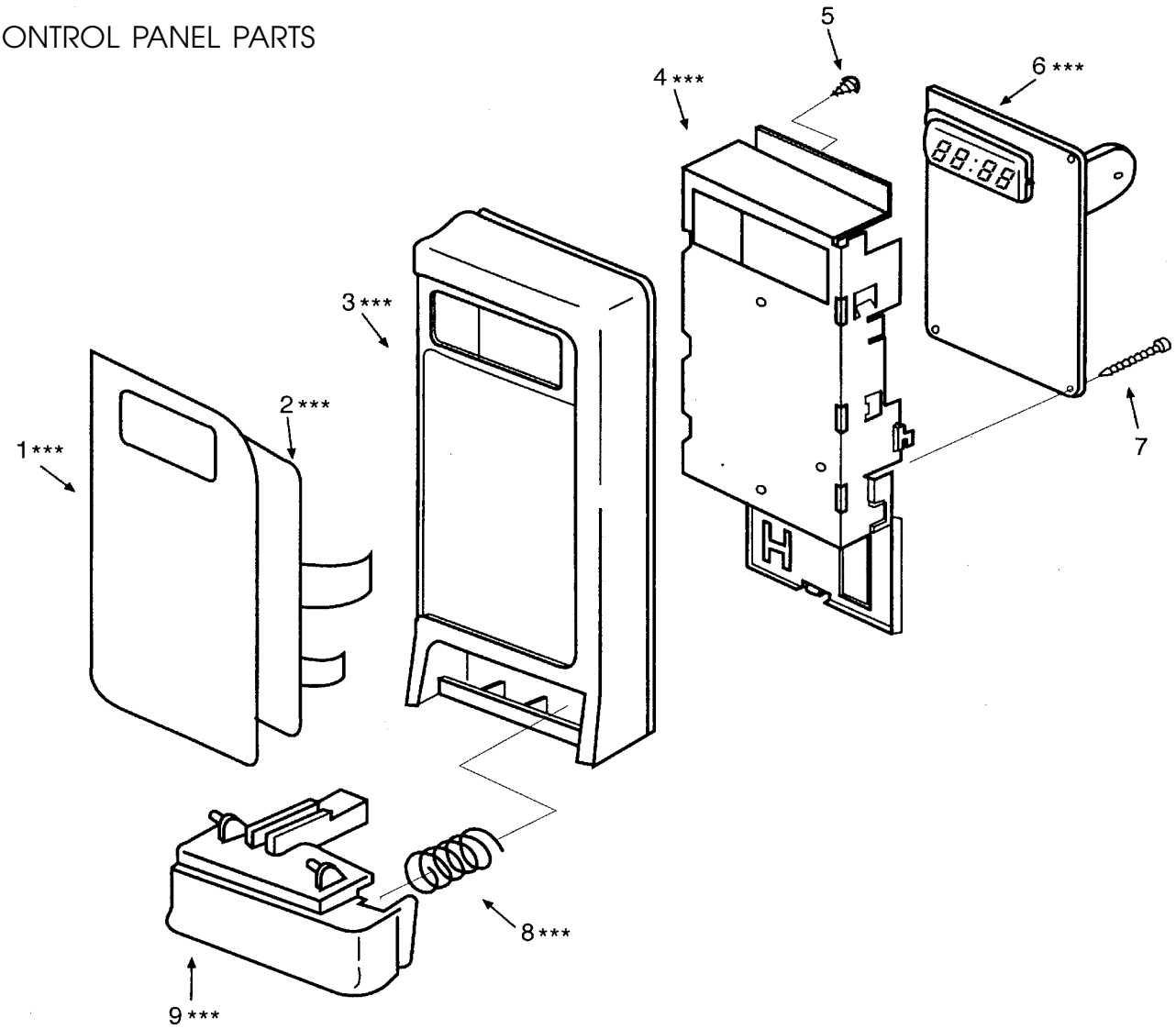
Key No.	Part No.	Description	Q'ty
1	617 207 0322	Door Cover***	1
2	617 207 0360	Door Panel***	1
3	617 201 2421	Door Main Frame*** (Also order Door Sheet when replacing Door Main Frame)	1
4	617 124 6490	Choke Dielectric***	1

Key No.	Part No.	Description	Q'ty
5	617 124 6483	Door Sheet	1
6	411 054 1903	Nut Hex + Flg W / SRT 5***	2
7	617 180 6151	Hinge, Upper***	1
8	411 011 0802	Bolt Hex + SW + W 5 x 14***	2
9	617 101 1494	Spring***	1
10	617 179 2478	Door Latch***	1

CONTROL PANEL PARTS



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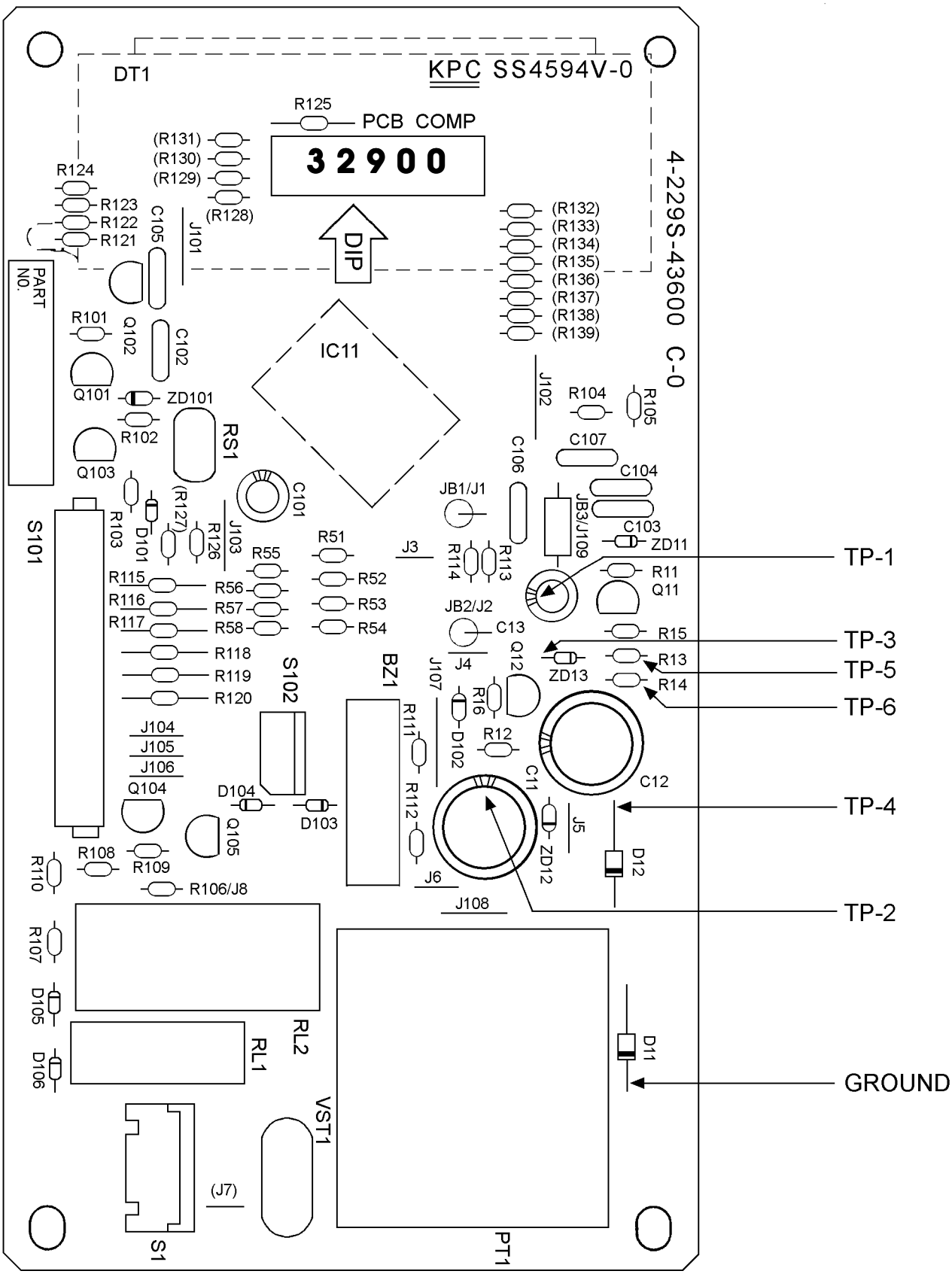
Key No.	Part No.	Description	Q'ty
1	617 221 5235	Control Sheet*** (Also order Touch Key Board when replacing Control Sheet)	1
2	617 219 4585	Touch Key Board*** (Also order Control Sheet when replacing Touch Key Board)	1
3	617 207 0346	Control Frame***	1

Key No.	Part No.	Description	Q'ty
4	617 207 0377	Control Base***	1
5	411 160 6205	SCR TPG TRS+SRT 4 x 10 Z1	1
6	617 220 2952	Power & Control Circuit Board***	1
7	411 129 5805	SCR TPG BIN 3 x 10 Z1	2
8	617 080 9559	Spring, Door Release Lever***	1
9	617 207 0353	Door Release Lever***	1

PRINTED MATTER (Items Not Illustrated)

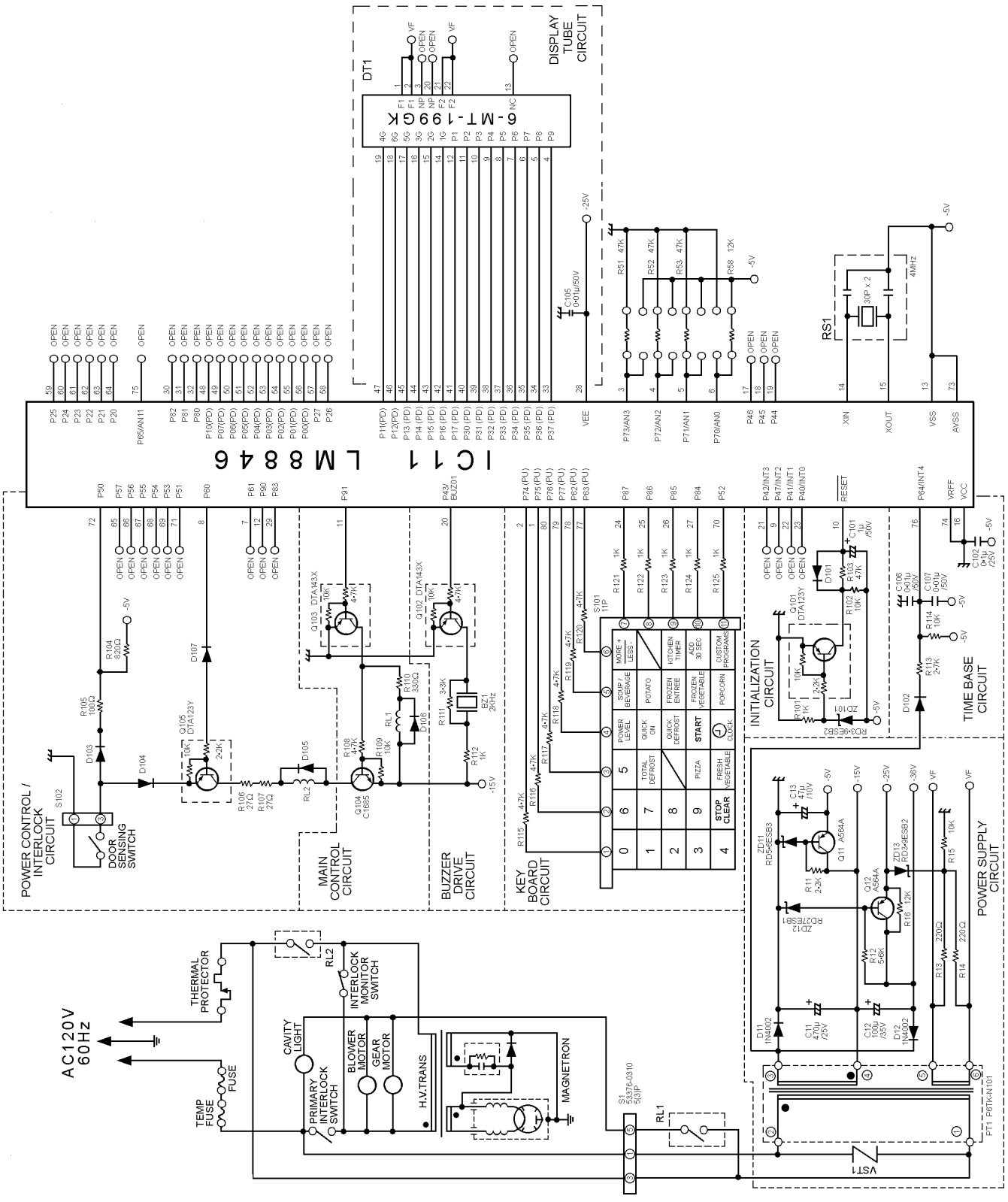
Key No.	Part No.	Description	Q'ty
	617 220 9562	Operating Instructions (English / Spanish)	1
	617 221 5273	Carton Box Complete	1
	617 221 5204	Name Plate	1

CONTROL CIRCUIT BOARD
(Part No. **617 220 2952**)



CONTROL CIRCUIT BOARD
(Part No. **617 220 2952**)

Key No.	Order Part No.	Description	Q'ty
INTEGRATED CIRCUIT.			
IC11	409 452 0901	IC LM8846-124FP	1
TRANSISTORS.			
Q104	405 035 4809	2SC1685-Q-TP.	1
Q101, 105	405 082 4609	DTA123YS-TP.	2
Q11, 12	405 005 8400	2SA854-Q-T93.	2
Q102, 103	405 000 1802	DTA143XS-TP.	2
DIODES.			
D11, 12	407 012 0200	1N4002-TP.	2
D101 ~ 107	407 012 4406	1SS133-TP.	7
ZD101	407 132 2306	HZS3.9NB2.	1
ZD11	407 057 0500	RD5.6ESB3.	1
ZD12	407 160 6703	RD27ESB1	1
ZD13	407 055 9000	RD3.9ESB2	1
CAPACITORS.			
C105 ~ 107	403 069 8305	Ceramic, 0.01mfd, ± 5%, 50V.	3
C102	403 002 4708	Ceramic, 0.1mfd, ± 5%, 25V.	1
C101	403 147 8807	Electrolytic, 1mfd, ± 20%, 50V.	1
C13	403 147 8609	Electrolytic, 47mfd, ± 20%, 10V.	1
C12	403 152 7307	Electrolytic, 100mfd, ± 20%, 35V.	1
C11	403 188 8408	Electrolytic, 470mfd, ± 20%, 25V.	1

Key No.	Order Part No.	Description	Q'ty
RESISTORS.			
R105	401 012 4404	Carbon, 100 ohms ± 5%, 1/4W.	1
R101, 112, 121 ~ 125	401 012 5609	Carbon, 1K ohms ± 5%, 1/4W.	7
R15, 102, 109, 114	401 012 6903	Carbon, 10K ohms ± 5%, 1/4W.	4
R16, 58	401 013 6308	Carbon, 12K ohms ± 5%, 1/4W.	2
R13, 14	401 016 2505	Carbon, 220 ohms ± 5%, 1/4W.	2
R11	401 016 3700	Carbon, 2.2K ohms ± 5%, 1/4W.	1
R106, 107	401 016 9603	Carbon, 27 ohms ± 5%, 1/4W.	2
R113	401 017 1705	Carbon, 2.7K ohms ± 5%, 1/4W.	1
R110	401 018 2701	Carbon, 330 ohms ± 5%, 1/4W.	1
R111	401 018 3708	Carbon, 3.3K ohms ± 5%, 1/4W.	1
R108, 115 ~ 120	401 020 1907	Carbon, 4.7K ohms ± 5%, 1/4W.	7
R51 ~ 53, 103	401 020 2805	Carbon, 47K ohms ± 5%, 1/4W.	4
R12	401 021 2903	Carbon, 5.6K ohms ± 5%, 1/4W.	1
R104	401 023 1607	Carbon, 820 ohms ± 5%, 1/4W.	1
MISCELLANEOUS.			
BZ1	420 000 6800	Buzzer PKM22EPT.	1
VST1	407 118 5505	Varistor ENC 471D-10A.	1
DT1	617 185 3735	Display Tube.	1
RL1	617 201 3978	Relay, G5N-1A-DC12.	1
RL2	617 141 0549	Relay, DU12D1-1PR.	1
RS1	617 128 3372	Ceramic Oscillator.	1
S1	617 169 4109	Connector.	1
S101	617 126 8959	Connector, 11P.	1
S102	617 111 1392	Connector, 2/3P, Male.	1
PT1	617 178 3933	Step-Down Transformer, P6TK-N101.	1
2	617 079 4107	Part Base.	1
J1 ~ 6	617 079 4299	Jumper.	6
J101 ~ 109	617 079 4237	Jumper.	9

9. OVERALL CIRCUIT DIAGRAM